SOLVAY

July 10, 2015

Steven Dietrich
WDEQ-Air Quality Division
122 W 25th Street
Cheyenne, WY 82002

RE: Submittal of RATA Reports for Boilers #1, #2, and #4 (AQD #18, #19, and #109)

Dear Steven:

Enclosed you will find the Relative Accuracy Test Audit reports for Boilers #1, #2, and #4 (AQD #18, #19, and #109). The testing was performed by Optimal Air Testing Services, Inc. as required per Operating Permit 3-1-126, Permit No. MD – 13083, and Greenhouse Gas Prevention of Significant Deterioration Permit #PSD – WY – 000004 – 2012.001.

AQD #109, tested on April 28th 2015, demonstrated compliance utilizing the reference method for oxygen, volumetric flowrate, carbon dioxide, and nitrogen oxides. The applicable standard was used to demonstrate compliance for carbon monoxide. AQD #18 and #19, tested on April 29th and 30th and May 4th demonstrated compliance using the reference method for oxygen, carbon dioxide, nitrogen oxides, and volumetric flowrate. Compliance was also demonstrated applying the applicable standard for sulfur dioxide.

Enclosed is a signed certification by Todd Brichacek, Sr. Vice President – Site Manager.

If you have any questions concerning the performance reports, feel free to contact me at 872-6571.

Respectfully submitted,

Ouisha Toenyes

Ouisha Toenyes
Environmental Engineer

cc: Tony Hoyt
Enclosures

SOLVAY

Permit No.'s OP 3-1-126, MD – 13083, and Greenhouse Gas Prevention of Significant Deterioration Permit #PSD – WY – 000004 – 2012.001.
AQD Source No. 18, 19, and 109
Relative Accuracy Test Audit Reports

"I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this report are true, accurate, and complete."

Name: Todd Brichacek

Signature: [signature]

Title: Senior Vice President-Site Manager

Date: 7/10/2015

Optimal Project 1501C

SOLVAY CHEMICALS, INC.
GREEN RIVER, WYOMING

BOILER #1 (BO-1), BOILER #2 (BO-2), AND BOILER #4 (BO-4)
RELATIVE ACCURACY TEST AUDIT REPORT
APRIL 28 TO MAY 4, 2015

Report submitted to:

Ms. Ouisha Toenyes
Environmental Engineer
Solvay Chemicals, Inc.
400 County Road 85
Green River, WY 82935

Report Prepared by:

9971 Landmark Lane
Casper, Wyoming 82604
(307) 237-0814

We certify that we have examined the information submitted in this report and believe the results presented are true, accurate, and complete.

Daniel Klassen
President

Justin Russell
Technical Writer

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1.0 INTRODUCTION

Solvay Chemicals, Inc. (Solvay) contracted Optimal Air Testing Services (Optimal) to conduct a Relative Accuracy Test Audit (RATA) on the Boiler 1 (BO-1), Boiler 2 (BO-2), and Boiler 4 (BO-4) continuous emission monitor system (CEMS) at the Green River plant. Title 40 of the Code of Federal Regulations Part 60 (40 CFR60) procedures were followed for the RATA program.

1.1 RATA Methodology

The RATA was conducted at each of the stacks. The relative accuracy (RA) of the CEMS was determined by comparing the results of reference method tests to the results of the installed CEMS. For BO-1 and BO-2, the RA of the oxygen (O_2), carbon dioxide (CO_2) and nitrogen oxides (NOx) continuous emission monitor system (CEMS) and the volumetric flow rate CEMS was less than 20 percent of the mean value of the reference method data. The RA of sulfur dioxide (SO_2) CEMS was less than 10 percent of the applicable standard.

For BO-4, the RA of the oxygen (O_2), carbon dioxide (CO_2) and nitrogen oxides (NOx) continuous emission monitor system (CEMS) and the volumetric flow rate CEMS was less than 20 percent of the mean value of the reference method data. The RA of carbon monoxide (CO) CEMS was less than 10 percent of the applicable standard.

O_2 and CO_2 RATA results are expressed in terms of percent, dry volume ($\%_{drv}$). CO, SO_2 and NOx RATA results are expressed as parts per million dry volume (ppm_{drv}), pounds per hour (lb/hr) and pound per million British Thermal Units (lb/mmBtu). Flow rate RATA results are expressed as thousand standard cubic feet per minute (kscfm).

The BO-1 Boiler Stack RATA was conducted on April 29 and 30, 2015. The BO-2 Boiler Stack RATA was conducted on May 4, 2015 and the BO-4 Boiler stack was done on April 28, 2015. Coordinating the test program were:

Ouisha Toenyes	**Dan Klassen**
Solvay Chemicals Inc.	Optimal Air Testing Services, Inc.
400 County Road 85	9971 Landmark Lane
Green River, WY 82935	Casper, WY 82604
Ph: (307) 875-6500	Ph: (307) 237-0814

1.2 Summary of Results

Table 1 Solvay BO-1 Boiler Stack RATA Results, April 29 and 30, 2015

Constituent	Units	EPA Test Method	Relative Accuracy (%)	Relative Accuracy Limit (calculation basis)
Oxygen	% $_{drv}$	3A	5.18	20 (Reference method)
Carbon Dioxide	% $_{drv}$	3A	4.21	20 (Reference method)
Sulfur Dioxide	ppm $_{drv}$	6C	0.52	10 (Applicable standard)
	lb/mmBtu	3A & 6C	0.67	10 (Applicable standard)
	lb/hr	1-4 & 6C	0.49	10 (Applicable standard)
Nitrogen Oxides	ppm $_{drv}$	7E	2.03	20 (Reference method)
	lb/mmBtu	3A & 7E	1.87	20 (Reference method)
	lb/hr	1-4 & 7E	3.15	20 (Reference method)
Volumetric Flow	kscfm	1, 2, 3 & 4	15.12	20 (Reference method)

Table 2 Solvay BO-2 Boiler Stack RATA Results, May 4, 2015

Constituent	Units	EPA Test Method	Relative Accuracy (%)	Relative Accuracy Limit (calculation basis)
Oxygen	% $_{drv}$	3A	3.11	20 (Reference method)
Carbon Dioxide	% $_{drv}$	3A	2.67	20 (Reference method)
Sulfur Dioxide	ppm $_{drv}$	6C	5.70	10 (Applicable standard)
	lb/mmBtu	3A & 6C	7.98	10 (Applicable standard)
	lb/hr	1-4 & 6C	6.10	10 (Applicable standard)
Nitrogen Oxides	ppm $_{drv}$	7E	1.88	20 (Reference method)
	lb/mmBtu	3A & 7E	1.95	20 (Reference method)
	lb/hr	1-4 & 7E	4.60	20 (Reference method)
Volumetric Flow	kscfm	1, 2, 3 & 4	3.69	20 (Reference method)

Table 3 Solvay BO-4 Boiler Stack RATA Results, April 28, 2015

Constituent	Units	EPA Test Method	Relative Accuracy (%)	Relative Accuracy Limit (calculation basis)
Oxygen	% $_{drv}$	3A	4.26	20 (Reference method)
Carbon Dioxide	% $_{drv}$	3A	2.90	20 (Reference method)
Carbon Monoxide	ppm $_{drv}$	10	0.01	5 (Applicable standard)
	ppm $_{drv}$- at 3% O_2	10	0.12	5 (Applicable standard)
	lb/mmBtu	3A & 10	0.00	5 (Applicable standard)
	lb/hr	1-4 & 10	0.04	5 (Applicable standard)
Nitrogen Oxides	ppm $_{drv}$	7E	11.15	20 (Reference method)
	ppm $_{drv}$- at 3% O_2	7E	11.90	20 (Reference method)
	lb/mmBtu	3A & 7E	12.15	20 (Reference method)
	lb/hr	1-4 & 7E	5.13	20 (Reference method)
Volumetric Flow	kscf/hr	1, 2, 3 & 4	7.92	20 (Reference method)

Complete summary of test results are presented in Appendix A. Included with the Appendix A results are charts visually comparing Solvay CEM data to Reference Method results. Reference Method field data is included in Appendix B and Solvay CEM data is attached in Appendix C. Spreadsheets used to reduce reference method data and calculate results are shown in Appendix D. Appendix E and F respectively contain on-site Reference Method CEM calibrations and equipment/calibration gas certifications. Sample calculations are shown in Appendix G. Solvay process data has been provided in Appendix H.

1.3 Description of Installation

Solvay Chemicals, Inc., located near Green River, Wyoming, is a mine and refinery with corporate offices in Houston, Texas.

The primary raw material for the Green River facility is sodium sesquicarbonate, commonly referred to as trona. The trona is mined at the plant site from an ore bed located 1,500 feet below the surface. The trona is hoisted to the surface before refining into soda ash and other sodium-based products.

The trona that is fed to the soda ash calciners is heated, resulting in thermal calcinations of the sodium sesquicarbonate forming a crude soda ash. The crude soda ash is dissolved in water and the insolubles are separated from the solution by settling and filtration. The insolubles are disposed of in the mine void. The high-purity saturated solution of sodium carbonate is then fed to crystallizers where a large amount of water is removed and a slurry of sodium carbonate monohydrate crystals is formed. This slurry is then further dewatered and washed by a series of cyclones and centrifuges. The resulting monohydrate crystals are fed through dryers forming a high quality soda ash, which then is ready for storage and shipment.

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1.4 Stack Sampling Location

The BO-1 Boiler Stack is a round vertical stack with a diameter of 86 $^{7}/_{8}$ inches. The test ports are located greater than eight diameters (67 feet) downstream and approximately 1.7 diameters (12 feet) upstream from the nearest flow disturbances. Reference Method CEM sampling points were located per Performance Specification (PS) 2. Four points were traversed for volumetric flow determination in each of the four 6.5 inch long test ports. The points traversed were 2 $^{3}/_{4}$ inches, 9 $^{1}/_{8}$ inches, 16 $^{3}/_{4}$ inches and 28 $^{1}/_{16}$ inches from the stack wall.

The BO-2 stack is a round vertical stack with a diameter of 86 $^{1}/_{8}$ inches. The test ports are located greater than eight diameters (67 feet) downstream and approximately 1.7 diameters (12 feet) upstream from the nearest flow disturbances. Reference Method CEM sampling points were located per Performance Specification (PS) 2. Four points were traversed for volumetric flow determination through four test ports, 8 $^{7}/_{8}$ inches long. The points traversed were 2 $^{3}/_{4}$ inches, 9 $^{1}/_{16}$ inches, 16 $^{11}/_{16}$ inches and 27 $^{13}/_{16}$ inches from the stack wall.

The BO-4 stack is a round vertical stack with a diameter of 71 $^{15}/_{16}$ inches. The test ports are located greater than eight diameters (82 feet) downstream and greater than two diameters (63 feet) upstream from the nearest flow disturbances. Reference Method CEM sampling points were located per Performance Specification (PS) 2. Six points were traversed for volumetric flow determination through two test ports, 6 $^{13}/_{16}$ inches long. The points traversed were 3 $^{5}/_{16}$ inches, 10 $^{9}/_{16}$ inches, 21 $^{5}/_{16}$ inches, 50 $^{11}/_{16}$ inches, 61 $^{7}/_{16}$ inches and 68 $^{3}/_{4}$ inches from the stack wall.

2.0 SUMMARY OF SAMPLING PROCEDURES

Optimal performed the following U.S. Environmental Protection Agency (EPA) test methods to meet the requirements of the specified work. These methods may be referenced in Title 40 of the Code of Federal Regulations, Part 60. The methods are titled as follows:

- Method 1 "Sample and Velocity Traverses for Stationary Sources;"
- Method 2 "Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube);"
- Method 3A "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources;"
- Method 4 "Determination of Moisture Content in Stack Gases;"
- Method 6C "Determination of Sulfur Dioxide Emissions from Stationary Sources;"
- Method 7E "Determination of Nitrogen Oxides Emissions from Stationary Sources;"
- Method 10 "Determination of Carbon Monoxide Emissions from Stationary Sources;"
- Method 205 "Verification of Gas Dilution Systems for Field Instrument Calibrations,"

Performance Specification 2 "Specifications and Test Procedures for SO_2 and NOx Continuous Emission Monitoring Systems in Stationary Sources;"

Performance Specification 3 "Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources;"

Performance Specification 4 "Specifications and Test Procedures for Carbon Monoxide Continuous Monitoring Systems in Stationary Sources;"

Performance Specification 6 "Specifications and Test Procedures for Continuous Emission Rate Monitoring Systems in Stationary Sources;"

3.0 METHODOLOGY

3.1 Determination of Stack Gas Velocity and Volumetric Flow Rate

Measurement of gas velocity and volumetric flow rate was conducted in accordance with EPA Reference Method 2 Procedures. The stack gas temperature and velocity head were measured at each traverse point, and used to calculate the gas velocity (Vs) and volumetric flow rate expressed in terms of acfm, scfm, dscfm and kscm/hr.

The sampling equipment consisted of a calibrated stausscheibe (Type S) pitot tube connected to an inclined manometer to determine the velocity head at each traverse point, a thermocouple and calibrated pyrometer to measure the gas temperature at each point, and straight tap or tube connected to a slack tube manometer to determine the static pressure in the duct. Measurements for flow rate determination were collected simultaneously with the corresponding gaseous sampling runs.

Molecular weight of the stack gas was acquired by measuring the oxygen and carbon dioxide content using EPA Method 3A (CEMS).

EPA Reference Method 4 was used to determine the flue gas moisture content. A gas sample was extracted from the stack and the moisture in the flue gas condensed in an impinger train and measured. The sample train consisted of a probe, filter, impinger train, pump and dry gas meter. The first and second impingers each contained 100 ml (or greater) of water, the third impinger remained empty and the fourth impinger contained a tare-weighted quantity of silica gel.

Following sampling, the sample train was leak checked and the impinger contents measured gravimetrically to determine the quantity of water collected. One moisture determination was collected for every two boiler stack velocity traverses (runs). Optimal CEMS run times were adjusted/synchronized to match the times of Solvay's CEMS data acquisition system (DAS).

3.2 Determination of O_2, CO_2, CO, SO_2 and NOx Concentrations

Instrumental Reference Method procedures for determination of oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen oxides (NOx) concentrations were conducted utilizing a common sampling apparatus. The gas sample was extracted from the source at a constant rate, through a stainless steel heated probe and a heated glass fiber filter. Upon leaving the filter, the gas sample passed through a Teflon sample line heated to 250°F. The sample then passed through a Baldwin gas conditioner to removes moisture. A particulate free, dry gas sample was then suitable for instrument introduction. The continuous gas analyzers used for sample analysis consisted of the following:

Table 4 Boiler RATA Reference Method Continuous Emission Monitors

Gas Constituent	Manufacturer	Model	Analysis Principle	Units Reported	Range used
Oxygen	California Analytical	ZRE	Electrochemical	(%, dry)	(0-22.92)
Carbon Dioxide	California Analytical	ZRE	Infrared	(%, dry)	(0-22.91)
Carbon Monoxide	California Analytical	ZRE	Infrared	(ppmdv)	(0-49.40)
Sulfur Dioxide	California Analytical	ZRF	Infrared	(ppmdv)	(0-50.00)
Nitrogen Oxides	California Analytical	ZRE	Infrared	(ppmdv)	(0-501.7)

Protocol gases were blended with a certified and calibrated mass flow gas divider to arrive at the desired calibration concentrations. Operation and on-site verification of the gas divider followed procedures listed in 40 CFR Part 51, Test Method 205, Appendix M entitled, "Verification of Gas Dilution Systems for Field Instrument Calibrations". Per Method 205, the gas divider is calibrated annually and verification of the gas divider operation was demonstrated on-site.

- An Environics Model 4040 gas divider with three mass flow controllers was used to blend nitrogen and the protocol gas mixtures for the desired calibration gas concentrations. The mass flow controllers in the gas divider were calibrated prior to testing, and the gas divider operation on-site was verified with the oxygen analyzer and an independent protocol calibration gas.

- The Gas Divider on-site verification was performed by entering two target concentrations into the Environics software. A high range protocol oxygen gas and the zero N_2 gas were blended with the mass flow controllers to meet the target concentrations that were introduced to the oxygen analyzer one at a time. Analyzer response was verified by introducing a mid-level calibration gas directly into the analyzer. This process was repeated in triplicate. All analyzer responses for the target concentrations and the verification gas did not deviate more than two percent from the predicted concentrations or more than two percent from the average instrument response for each concentration.

Reference method analyzer calibration error checks and linearity checks were performed.

- Blended protocol gases from the gas divider were introduced directly into each analyzer to determine analyzer calibration error daily and when power to the analyzers is interrupted. Three gases (zero, mid and high) were used for each pollutant analyzers. The difference between the calibration gas value and the analyzer response was less than two percent.
- Biases were checked before and after each run by challenging the entire sampling system with calibration gases (zero and mid) introduced between the sampling probe and the heated sample

line. The difference between the calibration gas value and the system response were less than 5 percent or the run was voided and the instrument recalibrated.

A data acquisition system (DAS) was used to record all gas concentrations and integrate these values every minute over six second intervals. These results were transferred to a computer program where average values corrected for calibration responses are reported.

3.3 Relative Accuracy

Calculations and procedures to calculate relative accuracy, listed in 40 CFR 60, Appendix B, Performance Specification 2, 3, 4 and 6 were followed. For the relative accuracy was less than 20 percent of the mean value of the reference method test data.

The Relative Accuracy (RA) methodology consisted of collecting multiple samples. Nine runs were completed; the data from all nine runs were used to calculate RA. The RA of the O_2, CO_2, NOx and volumetric flow rate was calculated using the mean value of the reference method data. The RA of SO_2 CEMS of BO-1 and BO-2 was calculated using the applicable standard. The CO CEMS of BO-4 was also calculated using the applicable standard.

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APPENDICES

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APPENDIX A

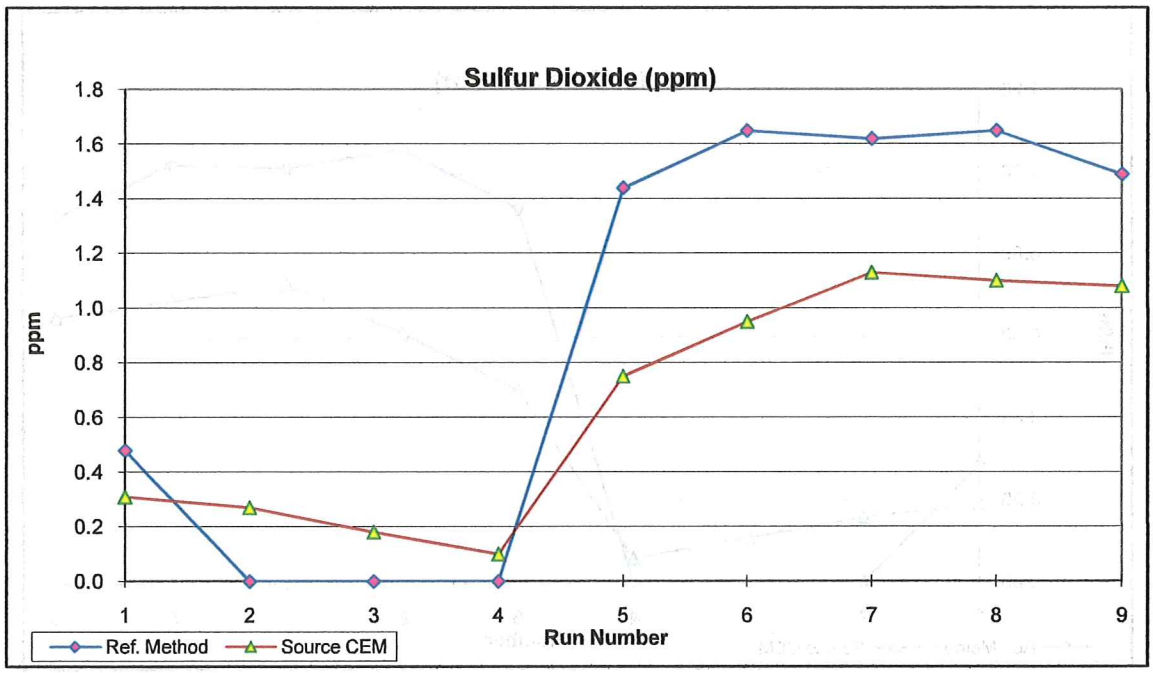
RATA Tables and Charts

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Sulfur Dioxide Emissions ppm

Relative Accuracy	N/A	*Limit = 20%*	Mean of Difference 0.273
RA based on Applicable std.	0.52	*Limit = 10%*	Applicable Standard 108
Confidence Coefficient (CC)	0.28		Mean of Reference Method 0.926
Standard Deviation	0.38		Mean of Source CEM Values 0.652



Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (ppm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	13:12	13:33	0.48	0.31	0.17			
2	1	16:14	16:35	0.00	0.27	-0.27	0.31	0.49	**226.30**
3	1	15:15	15:36	0.00	0.18	-0.18	0.23	0.30	**246.34**
4	1	16:20	16:41	0.00	0.10	-0.10	0.19	0.21	**256.45**
5	1	7:43	8:04	1.44	0.75	0.69	0.39	0.39	**117.34**
6	1	9:11	9:32	1.65	0.95	0.70	0.43	0.40	**94.98**
7	1	10:23	10:44	1.62	1.13	0.49	0.41	0.35	**76.22**
8	1	11:30	11:51	1.65	1.10	0.55	0.40	0.32	**67.17**
9	1	12:34	12:55	1.49	1.08	0.41	0.38	0.28	**60.12**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

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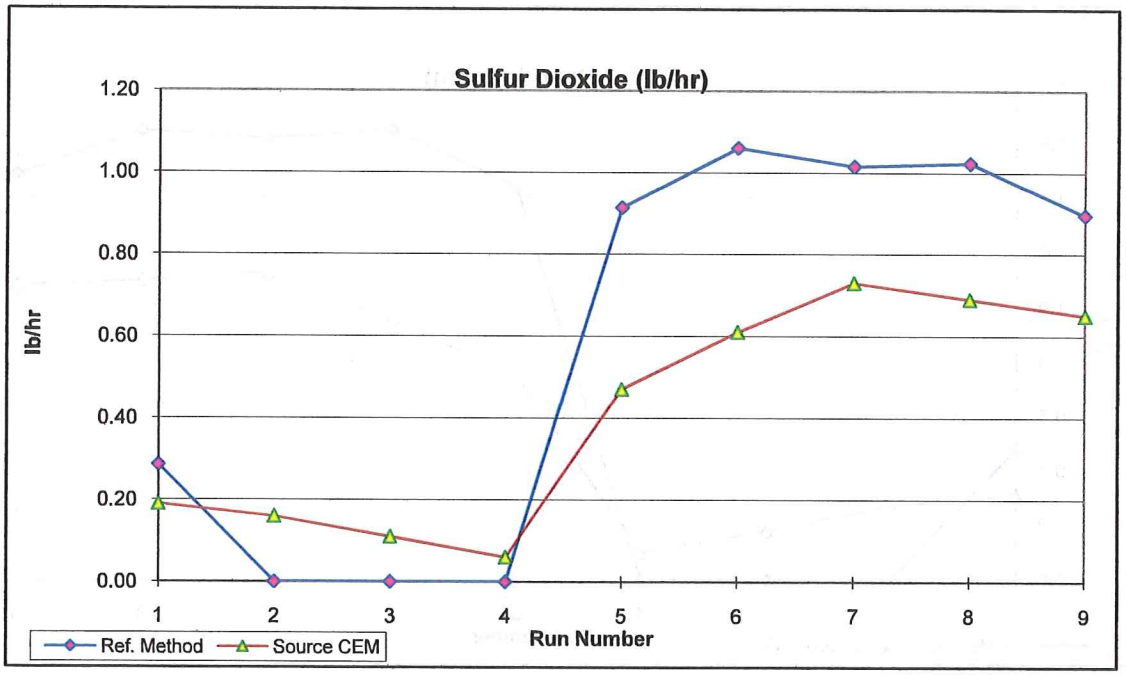
Sulfur Dioxide Emissions lb/hr
Relative Accuracy N/A *Limit = 20%* Mean of Difference 0.169
RA based on Applicable std. 0.49 *Limit = 10%* Applicable Standard 70
Confidence Coefficient (CC) 0.18 Mean of Reference Method 0.577
Standard Deviation 0.24 Mean of Source CEM Values 0.408



Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (lb/hr) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	13:12	13:33	0.29	0.19	0.10			
2	1	16:14	16:35	0.00	0.16	-0.16	0.18	0.29	**223.17**
3	1	15:15	15:36	0.00	0.11	-0.11	0.14	0.18	**245.23**
4	1	16:20	16:41	0.00	0.06	-0.06	0.11	0.12	**255.72**
5	1	7:43	8:04	0.91	0.47	0.44	0.24	0.24	**119.46**
6	1	9:11	9:32	1.06	0.61	0.45	0.27	0.25	**95.94**
7	1	10:23	10:44	1.02	0.73	0.29	0.26	0.22	**75.83**
8	1	11:30	11:51	1.02	0.69	0.33	0.25	0.20	**66.63**
9	1	12:34	12:55	0.89	0.65	0.24	0.24	0.18	**59.85**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

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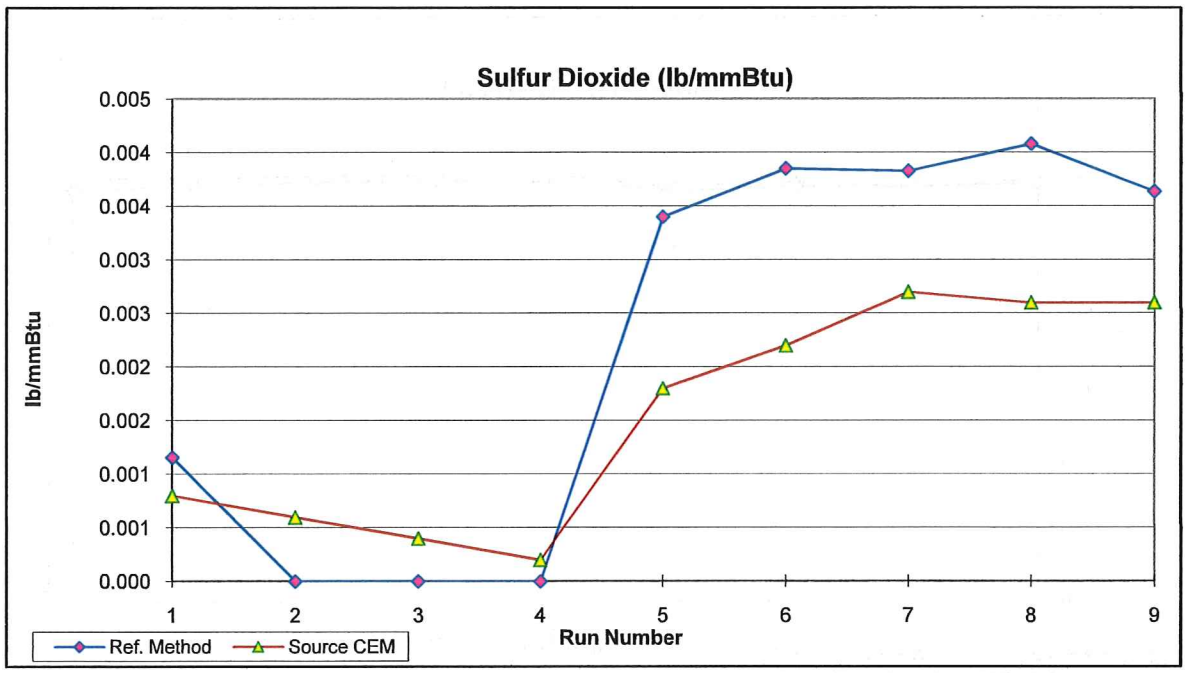
AIR TESTING SERVICES, INC

Sulfur Dioxide Emissions lb/mmBtu

Relative Accuracy	N/A	*Limit = 20%*	Mean of Difference 0.001
RA based on Applicable std.	0.67	*Limit = 10%*	Applicable Standard 0.2
Confidence Coefficient (CC)	0.00		Mean of Reference Method 0.002
Standard Deviation	0.00		Mean of Source CEM Values 0.002

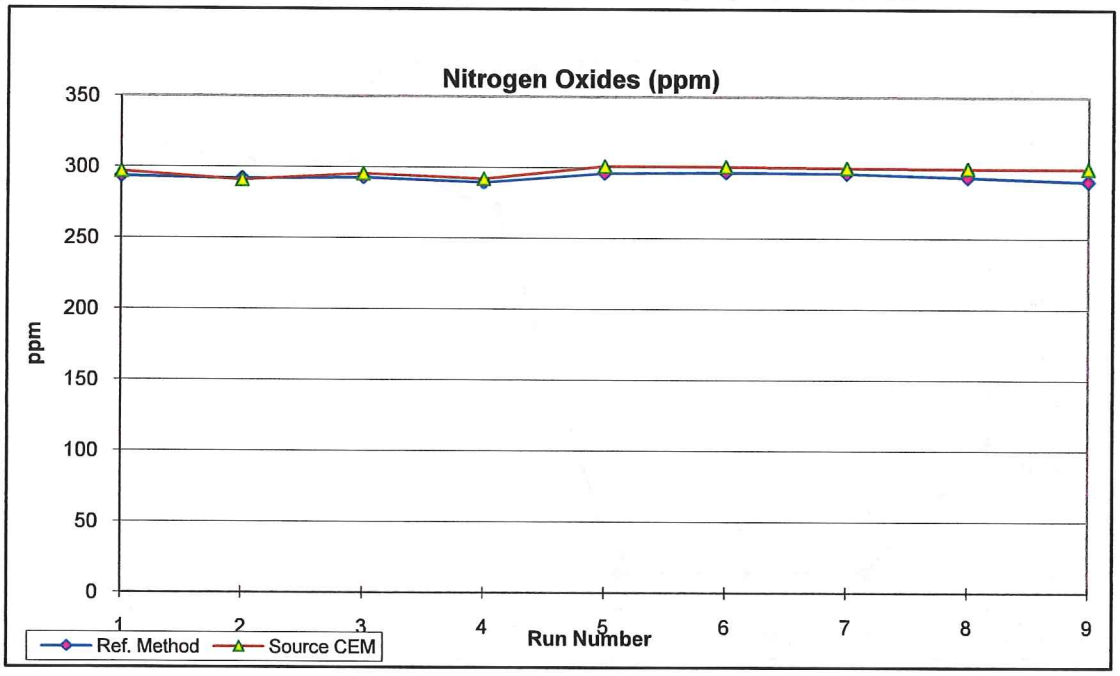


Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (lb/mmbtu) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	13:12	13:33	0.00	0.00	0.00			
2	1	16:14	16:35	0.00	0.00	0.00	0.00	0.001	**206.32**
3	1	15:15	15:36	0.00	0.00	0.00	0.00	0.001	**224.85**
4	1	16:20	16:41	0.00	0.00	0.00	0.00	0.000	**232.46**
5	1	7:43	8:04	0.00	0.00	0.00	0.00	0.001	**114.07**
6	1	9:11	9:32	0.00	0.00	0.00	0.00	0.001	**94.07**
7	1	10:23	10:44	0.00	0.00	0.00	0.00	0.001	**75.22**
8	1	11:30	11:51	0.00	0.00	0.00	0.00	0.001	**67.66**
9	1	12:34	12:55	0.00	0.00	0.00	0.00	0.001	**60.65**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions ppm
Relative Accuracy 2.03 *Limit = 20%* Mean of Difference -3.93
Confidence Coefficient (CC) 2.02 Mean of Reference Method 293.39
Standard Deviation 2.70 Mean of Source CEM Values 297.32

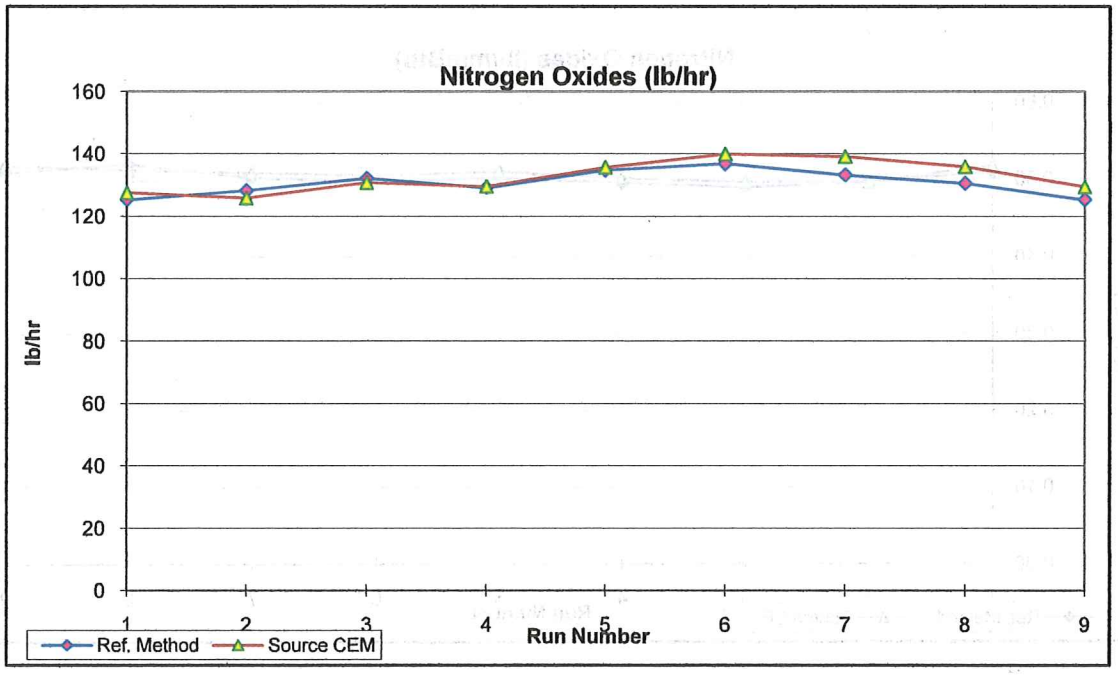


Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (ppm) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	13:12	13:33	293.41	296.72	-3.31			
2	1	16:14	16:35	291.86	290.84	1.02	3.06	4.853	**2.05**
3	1	15:15	15:36	292.73	295.43	-2.70	2.34	3.033	**1.60**
4	1	16:20	16:41	289.38	291.96	-2.58	1.97	2.205	**1.40**
5	1	7:43	8:04	296.01	300.95	-4.94	2.18	2.187	**1.60**
6	1	9:11	9:32	296.80	300.80	-4.00	2.05	1.872	**1.58**
7	1	10:23	10:44	296.19	300.02	-3.83	1.91	1.619	**1.54**
8	1	11:30	11:51	293.46	299.70	-6.24	2.13	1.685	**1.70**
9	1	12:34	12:55	290.67	299.49	-8.82	2.70	2.020	**2.03**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lb/hr
Relative Accuracy 3.15 *Limit = 20%* Mean of Difference -1.97
Confidence Coefficient (CC) 2.15 Mean of Reference Method 130.77
Standard Deviation 2.88 Mean of Source CEM Values 132.74



Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lb/hr) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	13:12	13:33	125.40	127.58	-2.18			
2	1	16:14	16:35	128.37	125.94	2.43	3.26	5.171	**4.18**
3	1	15:15	15:36	132.36	130.88	1.48	2.44	3.151	**2.90**
4	1	16:20	16:41	129.32	129.66	-0.34	2.04	2.287	**2.04**
5	1	7:43	8:04	134.90	135.80	-0.90	1.85	1.858	**1.50**
6	1	9:11	9:32	137.02	140.04	-3.02	2.09	1.912	**1.78**
7	1	10:23	10:44	133.40	139.21	-5.81	2.79	2.365	**2.70**
8	1	11:30	11:51	130.71	135.99	-5.28	2.96	2.346	**3.08**
9	1	12:34	12:55	125.41	129.52	-4.11	2.88	2.154	**3.15**

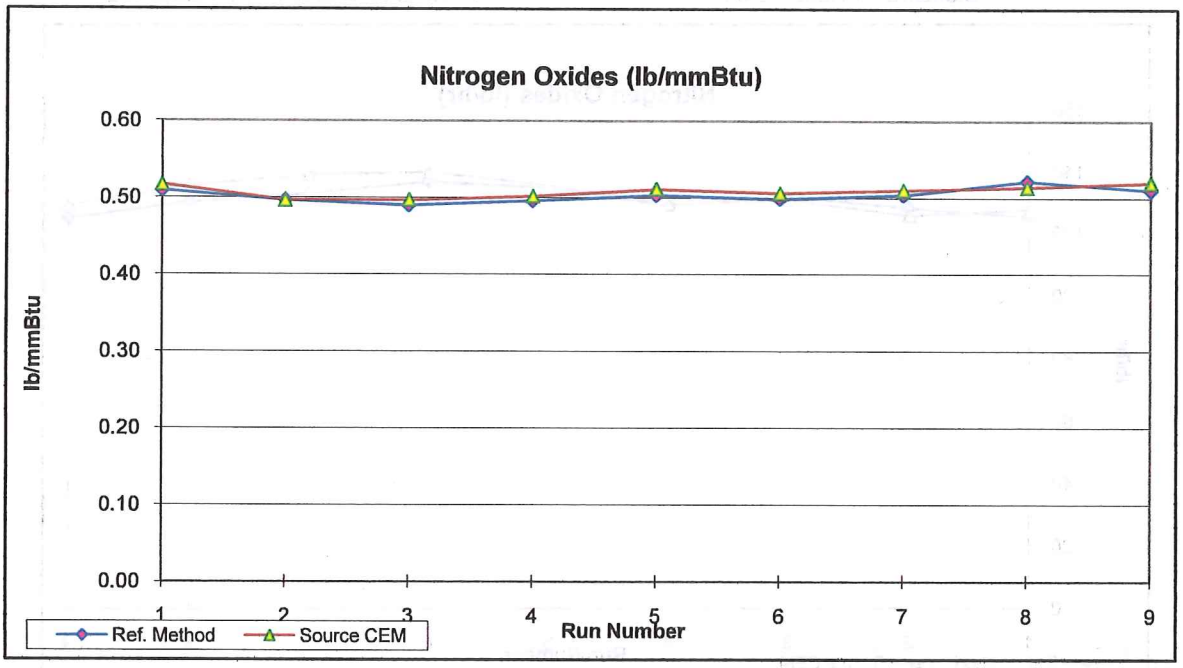
Company: Solvay Chemicals
Facility: Green River
Source: BO-1
Location: Vertical Stack

Date: 4/29/15
Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lb/mmBtu

Relative Accuracy	1.87	*Limit = 20%*	Mean of Difference -0.0053
RA based on Applicable std.	1.34	*Limit = 10%*	Applicable Standard 0.7
Confidence Coefficient (CC)	0.0042		Mean of Reference Method 0.5028
Standard Deviation	0.0056		Mean of Source CEM Values 0.5080



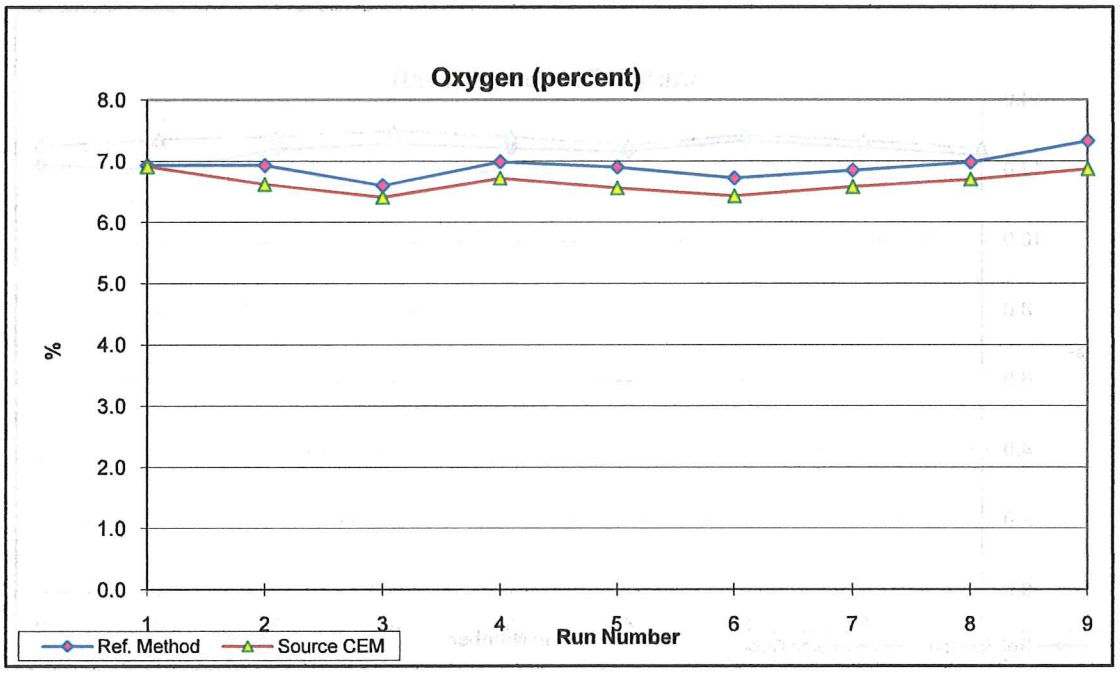
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lb/mmBtu) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	13:12	13:33	0.5086	0.5165	-0.0079			
2	1	16:14	16:35	0.4963	0.4964	-0.0001	0.0055	0.0087	**2.54**
3	1	15:15	15:36	0.4893	0.4966	-0.0073	0.0044	0.0056	**2.16**
4	1	16:20	16:41	0.4952	0.5016	-0.0064	0.0036	0.0040	**1.90**
5	1	7:43	8:04	0.5026	0.5111	-0.0085	0.0034	0.0034	**1.90**
6	1	9:11	9:32	0.4980	0.5061	-0.0081	0.0032	0.0029	**1.86**
7	1	10:23	10:44	0.5033	0.5101	-0.0068	0.0029	0.0025	**1.78**
8	1	11:30	11:51	0.5217	0.5141	0.0076	0.0057	0.0045	**1.83**
9	1	12:34	12:55	0.5100	0.5198	-0.0098	0.0056	0.0042	**1.87**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Oxygen Concentration %

Relative Accuracy 5.18 *Limit = 20%* Mean of Difference 0.270
Confidence Coefficient (CC) 0.09 Mean of Reference Method 6.914
Standard Deviation 0.12 Mean of Source CEM Values 6.644



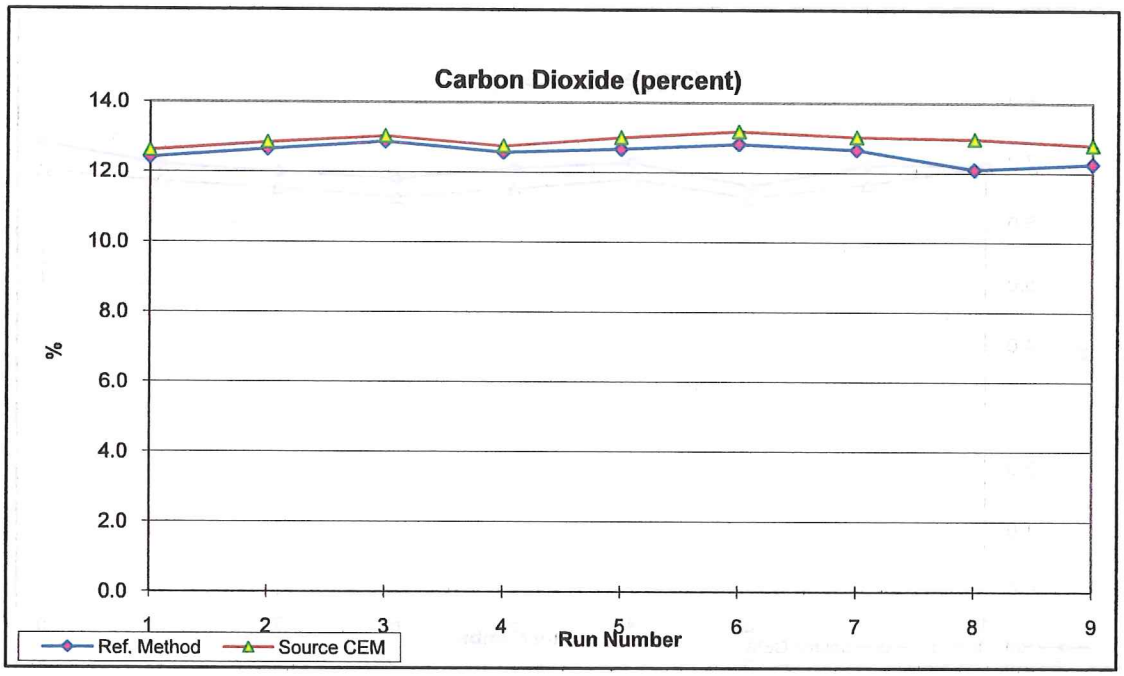
Run	Flag	Initial Minute	Stop Time	Oxygen (percent) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	13:12	13:33	6.93	6.91	0.02			
2	1	16:14	16:35	6.93	6.62	0.31	0.21	0.325	**7.07**
3	1	15:15	15:36	6.60	6.41	0.19	0.15	0.189	**5.31**
4	1	16:20	16:41	6.99	6.72	0.27	0.13	0.144	**4.98**
5	1	7:43	8:04	6.90	6.56	0.34	0.13	0.128	**5.16**
6	1	9:11	9:32	6.72	6.43	0.29	0.12	0.108	**5.03**
7	1	10:23	10:44	6.85	6.58	0.27	0.11	0.092	**4.86**
8	1	11:30	11:51	6.98	6.70	0.28	0.10	0.080	**4.75**
9	1	12:34	12:55	7.33	6.87	0.46	0.12	0.088	**5.18**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Dioxide Conc. %

Relative Accuracy 4.21 *Limit = 20%* Mean of Difference -0.358
Confidence Coefficient (CC) 0.17 Mean of Reference Method 12.547
Standard Deviation 0.23 Mean of Source CEM Values 12.904



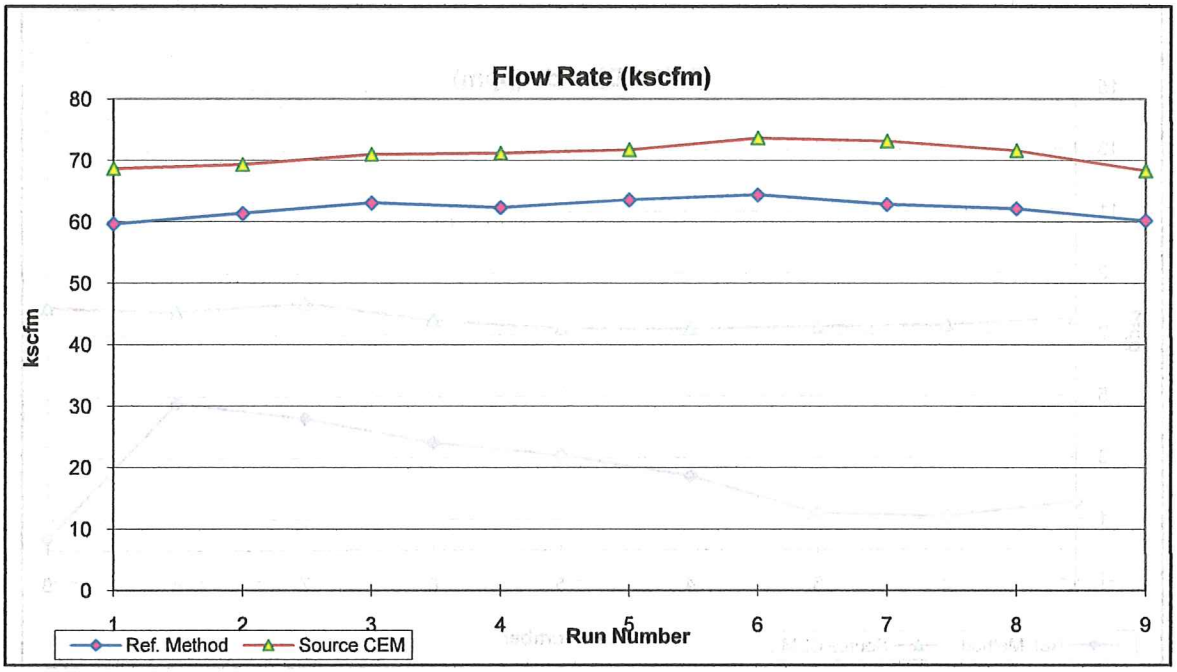
Run	Flag	Initial Minute	Stop Time	Carbon Dioxide (percent) Ref. Metho	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	13:12	13:33	12.40	12.61	-0.21			
2	1	16:14	16:35	12.64	12.84	-0.20	0.01	0.011	**1.73**
3	1	15:15	15:36	12.86	13.02	-0.16	0.03	0.034	**1.77**
4	1	16:20	16:41	12.56	12.74	-0.18	0.02	0.025	**1.68**
5	1	7:43	8:04	12.66	12.99	-0.33	0.07	0.067	**2.24**
6	1	9:11	9:32	12.81	13.17	-0.36	0.08	0.077	**2.50**
7	1	10:23	10:44	12.65	13.02	-0.37	0.09	0.077	**2.65**
8	1	11:30	11:51	12.09	12.96	-0.87	0.23	0.184	**4.12**
9	1	12:34	12:55	12.25	12.79	-0.54	0.23	0.170	**4.21**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1 Date: 4/29/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Standard Flow Rate kscfm

Relative Accuracy 15.12	*Limit = 20%*	Mean of Difference -9
Confidence Coefficient (CC) 1		Mean of Reference Method 62
Standard Deviation 1		Mean of Source CEM Values 71



Run	Flag	Initial Minute	Stop Time	Flowrate (kscfm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	13:12	13:33	59.65	68.71	-9			
2	1	16:14	16:35	61.39	69.35	-8	1	1	**16.10**
3	1	15:15	15:36	63.11	71.03	-8	1	1	**14.91**
4	1	16:20	16:41	62.37	71.21	-9	1	1	**14.77**
5	1	7:43	8:04	63.61	71.78	-8	1	1	**14.37**
6	1	9:11	9:32	64.44	73.70	-9	1	1	**14.54**
7	1	10:23	10:44	62.86	73.19	-10	1	1	**15.24**
8	1	11:30	11:51	62.17	71.63	-9	1	1	**15.27**
9	1	12:34	12:55	60.22	68.35	-8	1	1	**15.12**

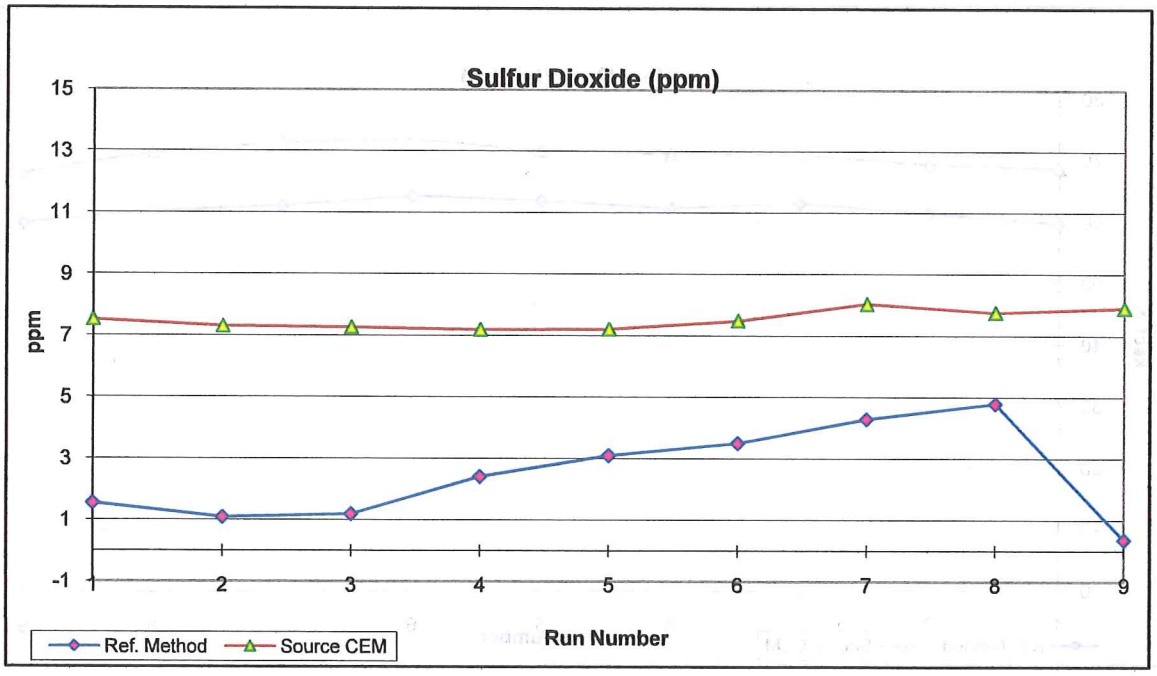
Company: Solvay Chemicals
Facility: Green River
Source: BO-2
Location: Vertical Stack

Date: 5/4/15
Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Sulfur Dioxide Emissions ppm

Relative Accuracy	N/A	*Limit = 20%*	Mean of Difference -5.049
RA based on Applicable std.	5.70	*Limit = 10%*	Applicable Standard 108
Confidence Coefficient (CC)	1.10		Mean of Reference Method 2.471
Standard Deviation	1.48		Mean of Source CEM Values 7.520



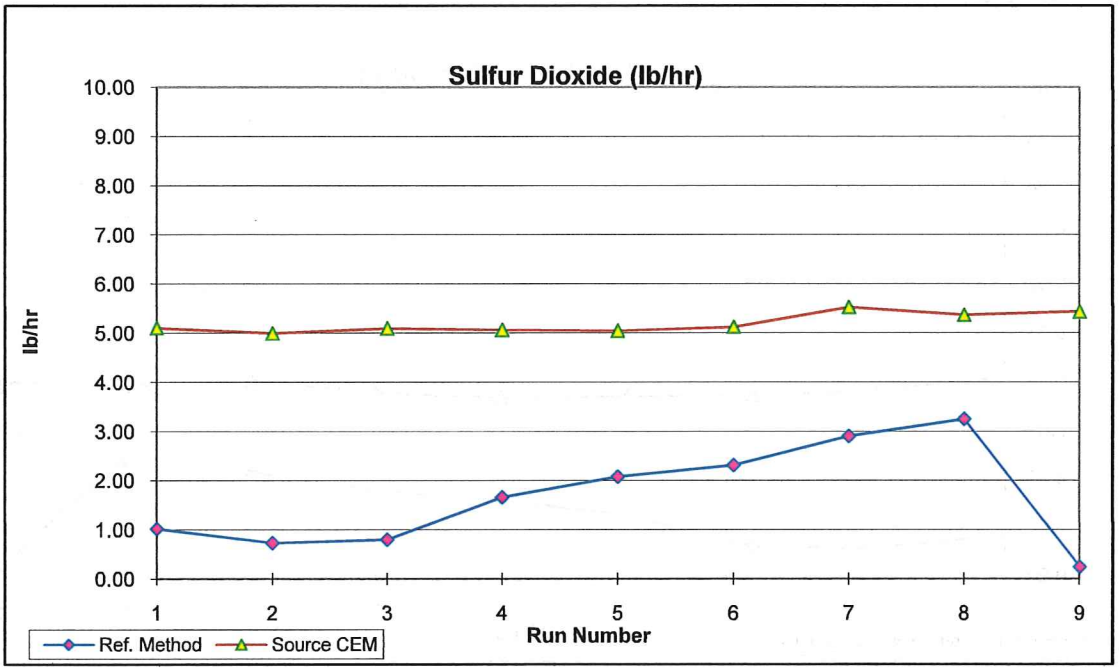
Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (ppm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	8:43	9:04	1.55	7.52	-5.97			
2	1	9:27	9:48	1.09	7.30	-6.21	0.17	0.27	**481.74**
3	1	10:19	10:40	1.19	7.26	-6.07	0.12	0.16	**488.72**
4	1	11:12	11:33	2.41	7.19	-4.78	0.66	0.74	**416.42**
5	1	12:08	12:29	3.09	7.21	-4.12	0.93	0.93	**340.87**
6	1	12:58	13:19	3.49	7.49	-4.00	1.02	0.93	**286.45**
7	1	13:44	14:05	4.28	8.04	-3.76	1.07	0.91	**241.37**
8	1	14:30	14:51	4.78	7.76	-2.98	1.22	0.97	**208.55**
9	1	15:18	15:39	0.36	7.91	-7.55	1.48	1.10	**249.00**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Sulfur Dioxide Emissions lb/hr

Relative Accuracy	N/A	*Limit = 20%*	Mean of Difference -3.528
RA based on Applicable std.	6.10	*Limit = 10%*	Applicable Standard 70
Confidence Coefficient (CC)	0.74		Mean of Reference Method 1.672
Standard Deviation	0.99		Mean of Source CEM Values 5.200



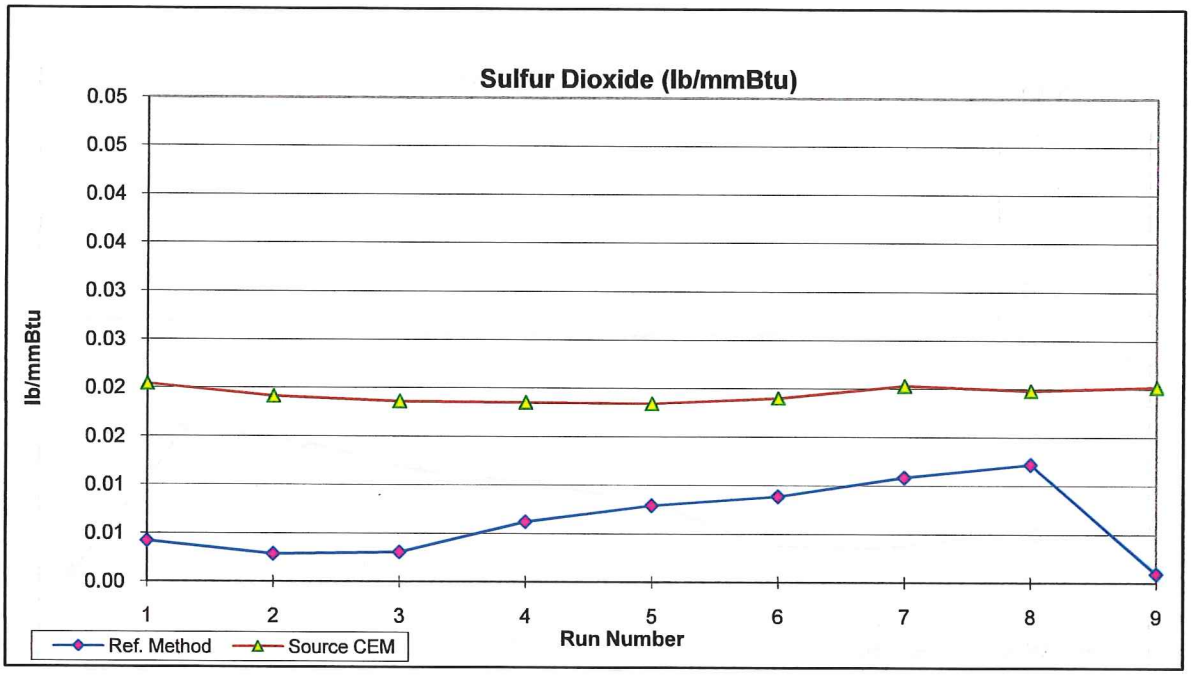
Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (lb/hr) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	8:43	9:04	1.02	5.11	-4.09			
2	1	9:27	9:48	0.74	5.00	-4.26	0.13	0.20	**496.64**
3	1	10:19	10:40	0.81	5.10	-4.29	0.11	0.15	**509.28**
4	1	11:12	11:33	1.67	5.07	-3.40	0.42	0.47	**422.83**
5	1	12:08	12:29	2.08	5.05	-2.97	0.59	0.59	**347.71**
6	1	12:58	13:19	2.32	5.13	-2.81	0.66	0.61	**295.01**
7	1	13:44	14:05	2.91	5.53	-2.62	0.72	0.61	**248.66**
8	1	14:30	14:51	3.26	5.37	-2.11	0.82	0.65	**214.75**
9	1	15:18	15:39	0.25	5.44	-5.19	0.99	0.74	**255.39**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Sulfur Dioxide Emissions lb/mmBtu

Relative Accuracy	N/A	*Limit = 20%*	Mean of Difference -0.013
RA based on Applicable std.	7.98	*Limit = 10%*	Applicable Standard 0.2
Confidence Coefficient (CC)	0.00		Mean of Reference Method 0.006
Standard Deviation	0.00		Mean of Source CEM Values 0.019

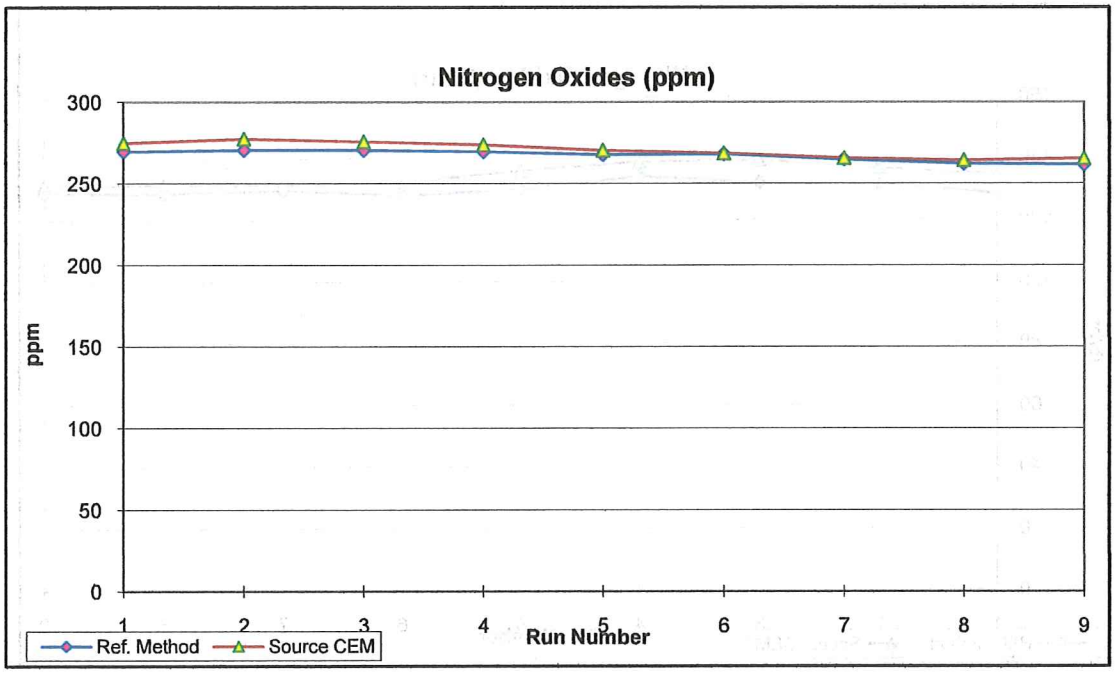


Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (lb/mmBtu) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	8:43	9:04	0.00	0.02	-0.02			
2	1	9:27	9:48	0.00	0.02	-0.02	0.00	0.000	**461.80**
3	1	10:19	10:40	0.00	0.02	-0.02	0.00	0.000	**490.55**
4	1	11:12	11:33	0.01	0.02	-0.01	0.00	0.002	**422.07**
5	1	12:08	12:29	0.01	0.02	-0.01	0.00	0.003	**347.25**
6	1	12:58	13:19	0.01	0.02	-0.01	0.00	0.003	**292.63**
7	1	13:44	14:05	0.01	0.02	-0.01	0.00	0.003	**247.06**
8	1	14:30	14:51	0.01	0.02	-0.01	0.00	0.003	**213.12**
9	1	15:18	15:39	0.00	0.02	-0.02	0.00	0.003	**252.40**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions ppm
Relative Accuracy 1.88 *Limit = 20%* Mean of Difference -3.43
Confidence Coefficient (CC) 1.59 Mean of Reference Method 267.42
Standard Deviation 2.13 Mean of Source CEM Values 270.85

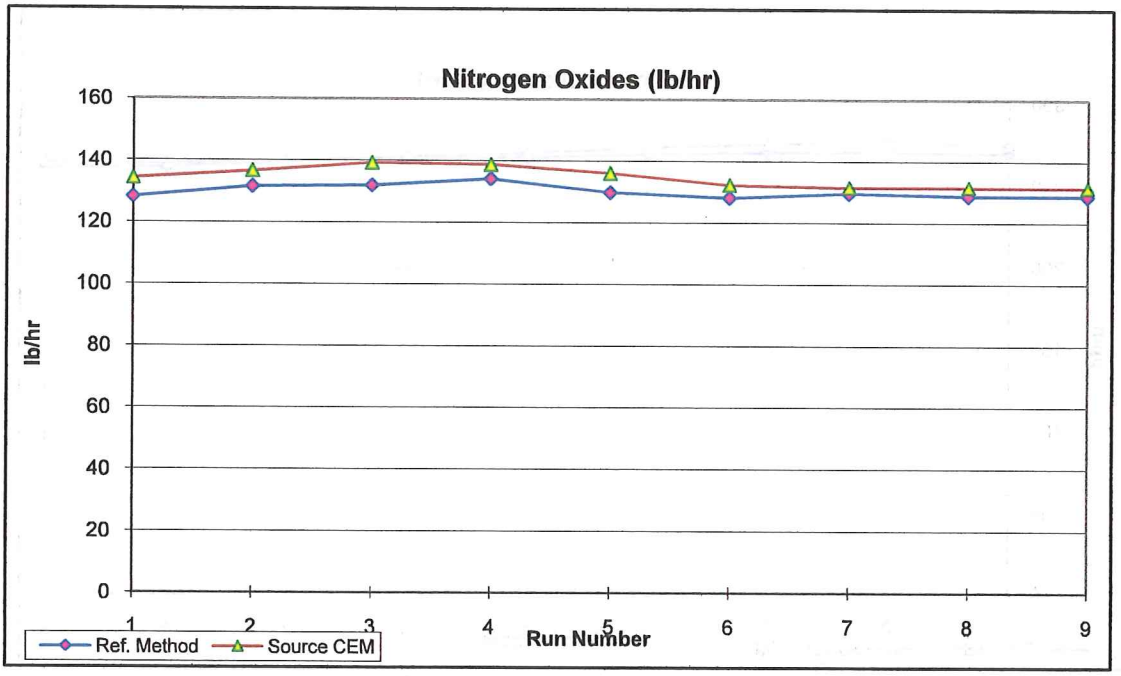


Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (ppm) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	8:43	9:04	269.84	275.01	-5.17			
2	1	9:27	9:48	270.80	277.61	-6.81	1.16	1.838	**2.90**
3	1	10:19	10:40	270.74	275.86	-5.12	0.96	1.244	**2.57**
4	1	11:12	11:33	269.78	274.01	-4.23	1.08	1.205	**2.42**
5	1	12:08	12:29	267.95	270.52	-2.57	1.55	1.551	**2.35**
6	1	12:58	13:19	268.30	268.80	-0.50	2.23	2.040	**2.27**
7	1	13:44	14:05	265.08	265.87	-0.79	2.38	2.018	**2.09**
8	1	14:30	14:51	262.47	264.47	-2.00	2.28	1.804	**1.94**
9	1	15:18	15:39	261.84	265.52	-3.68	2.13	1.593	**1.88**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lb/hr
Relative Accuracy 4.60 *Limit = 20%* Mean of Difference -4.68
Confidence Coefficient (CC) 1.31 Mean of Reference Method 129.97
Standard Deviation 1.75 Mean of Source CEM Values 134.64



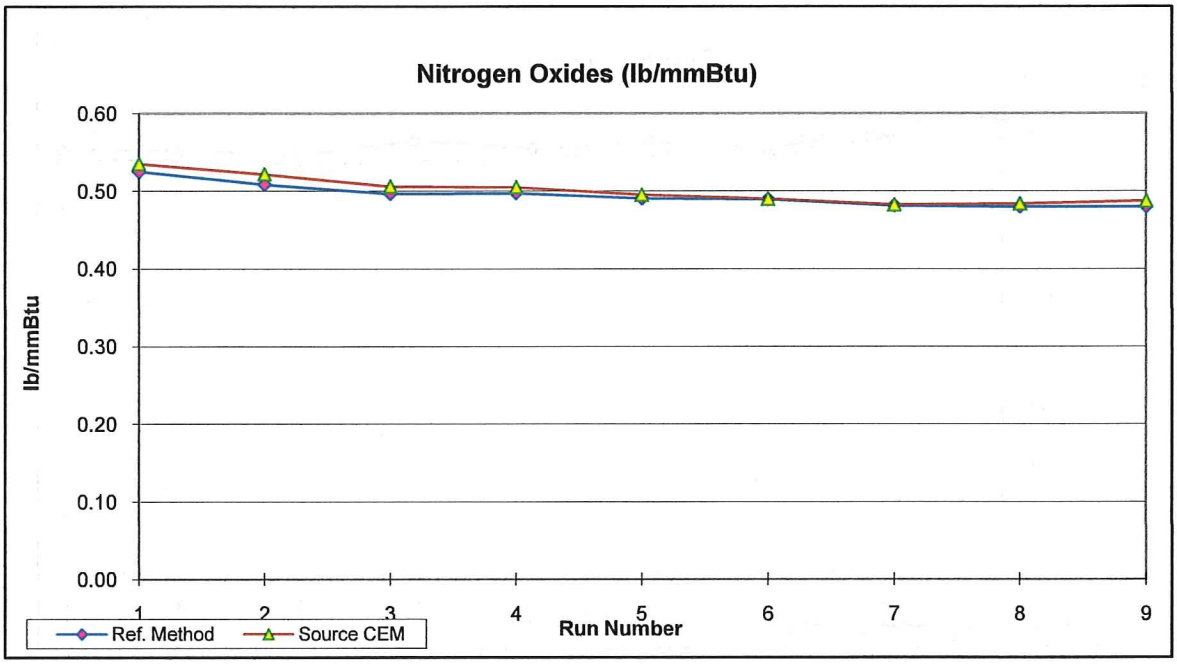
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lb/hr) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	8:43	9:04	128.19	134.25	-6.06			
2	1	9:27	9:48	131.47	136.58	-5.11	0.67	1.064	**5.12**
3	1	10:19	10:40	131.85	139.26	-7.41	1.16	1.496	**5.89**
4	1	11:12	11:33	134.11	138.76	-4.65	1.22	1.365	**5.46**
5	1	12:08	12:29	129.70	136.06	-6.36	1.08	1.087	**5.34**
6	1	12:58	13:19	127.96	132.31	-4.35	1.16	1.064	**5.15**
7	1	13:44	14:05	129.43	131.56	-2.13	1.70	1.442	**5.06**
8	1	14:30	14:51	128.53	131.57	-3.04	1.74	1.382	**4.82**
9	1	15:18	15:39	128.44	131.42	-2.98	1.75	1.309	**4.60**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lb/mmBtu

Relative Accuracy	1.95	*Limit = 20%*	Mean of Difference -0.0065
RA based on Applicable std.	1.38	*Limit = 10%*	Applicable Standard 0.7
Confidence Coefficient (CC)	0.0031		Mean of Reference Method 0.4946
Standard Deviation	0.0042		Mean of Source CEM Values 0.5011



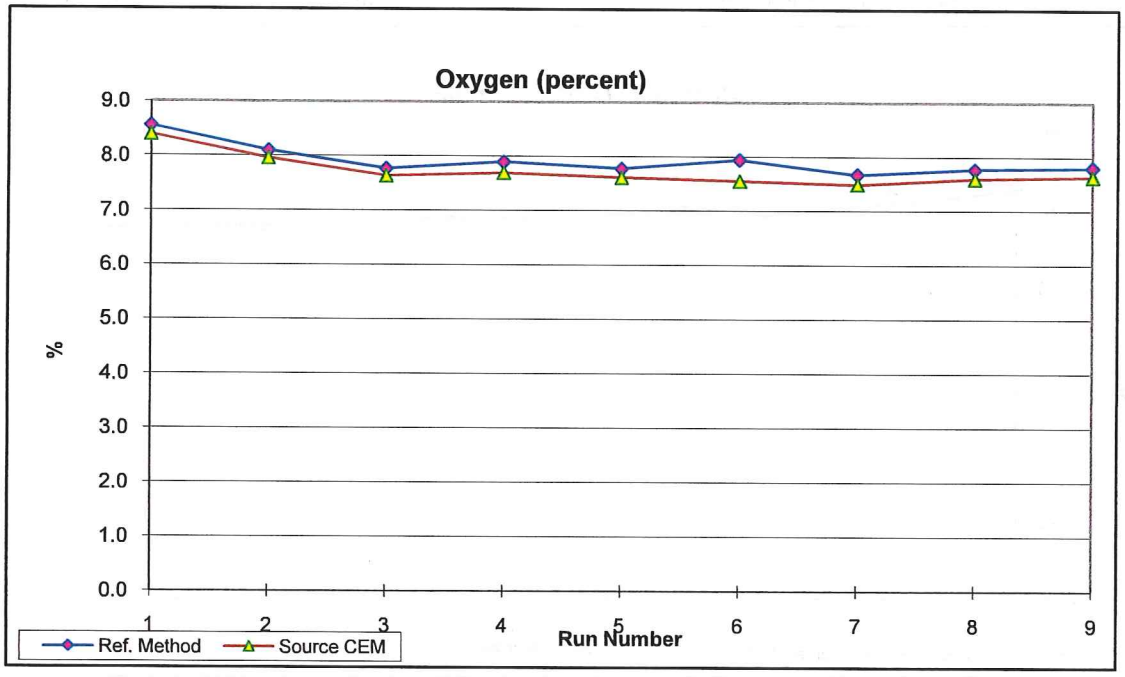
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lb/mmBtu) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	8:43	9:04	0.5254	0.5355	-0.0101			
2	1	9:27	9:48	0.5088	0.5221	-0.0133	0.0022	0.0035	**2.95**
3	1	10:19	10:40	0.4970	0.5064	-0.0094	0.0021	0.0027	**2.67**
4	1	11:12	11:33	0.4977	0.5054	-0.0077	0.0024	0.0026	**2.52**
5	1	12:08	12:29	0.4910	0.4956	-0.0046	0.0032	0.0032	**2.43**
6	1	12:58	13:19	0.4896	0.4904	-0.0008	0.0044	0.0040	**2.33**
7	1	13:44	14:05	0.4816	0.4829	-0.0013	0.0047	0.0040	**2.15**
8	1	14:30	14:51	0.4801	0.4841	-0.0040	0.0045	0.0035	**2.00**
9	1	15:18	15:39	0.4802	0.4877	-0.0075	0.0042	0.0031	**1.95**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Oxygen Concentration %

Relative Accuracy 3.11 *Limit = 20%* Mean of Difference 0.188
Confidence Coefficient (CC) 0.06 Mean of Reference Method 7.916
Standard Deviation 0.08 Mean of Source CEM Values 7.728



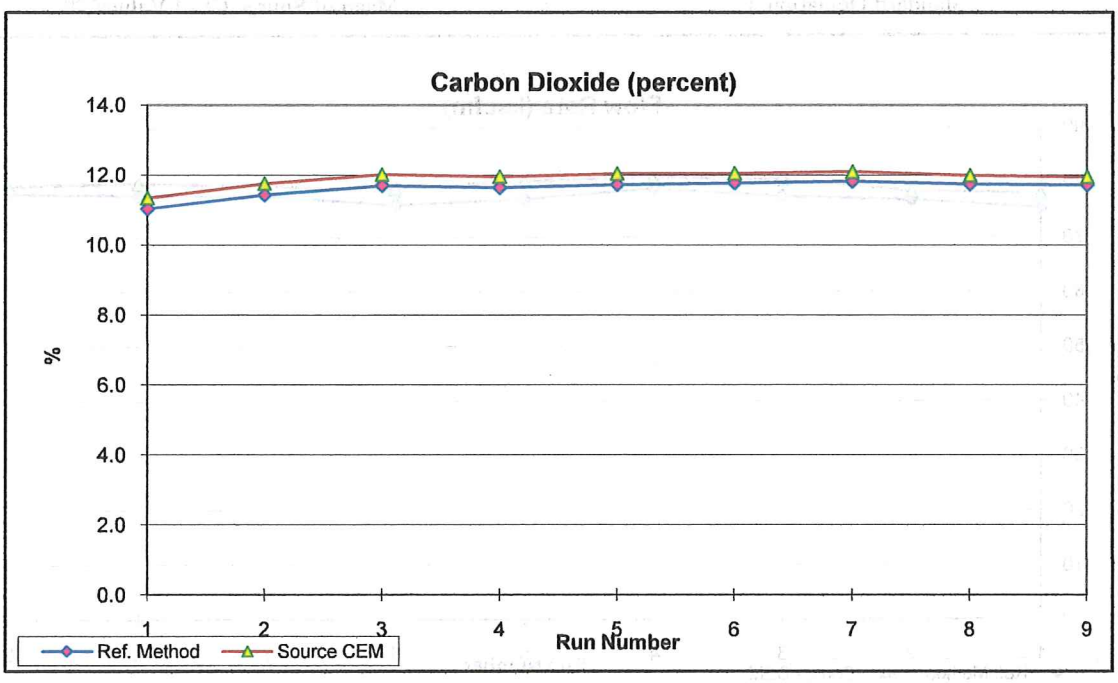
Run	Flag	Initial Minute	Stop Time	Oxygen (percent) Ref. Metho	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	8:43	9:04	8.55	8.39	0.16			
2	1	9:27	9:48	8.09	7.95	0.14	0.01	0.022	**2.07**
3	1	10:19	10:40	7.76	7.63	0.13	0.02	0.020	**2.01**
4	1	11:12	11:33	7.89	7.69	0.20	0.03	0.035	**2.38**
5	1	12:08	12:29	7.77	7.61	0.16	0.03	0.027	**2.31**
6	1	12:58	13:19	7.94	7.55	0.39	0.10	0.089	**3.58**
7	1	13:44	14:05	7.67	7.49	0.18	0.09	0.076	**3.40**
8	1	14:30	14:51	7.77	7.60	0.17	0.08	0.066	**3.24**
9	1	15:18	15:39	7.80	7.64	0.16	0.08	0.059	**3.11**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2 Date: 5/4/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Dioxide Conc. %

Relative Accuracy	2.67	*Limit = 20%*	Mean of Difference -0.286
Confidence Coefficient (CC)	0.03		Mean of Reference Method 11.628
Standard Deviation	0.03		Mean of Source CEM Values 11.913



Run	Flag	Initial Minute	Stop Time	Carbon Dioxide (percent) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	8:43	9:04	11.04	11.35	-0.31			
2	1	9:27	9:48	11.44	11.76	-0.32	0.01	0.011	**2.90**
3	1	10:19	10:40	11.71	12.02	-0.31	0.01	0.007	**2.81**
4	1	11:12	11:33	11.65	11.96	-0.31	0.01	0.006	**2.78**
5	1	12:08	12:29	11.73	12.04	-0.31	0.00	0.004	**2.75**
6	1	12:58	13:19	11.78	12.05	-0.27	0.02	0.016	**2.78**
7	1	13:44	14:05	11.83	12.10	-0.27	0.02	0.018	**2.74**
8	1	14:30	14:51	11.75	11.99	-0.24	0.03	0.023	**2.71**
9	1	15:18	15:39	11.72	11.95	-0.23	0.03	0.025	**2.67**

Company: Solvay Chemicals
Facility: Green River
Source: BO-2
Location: Vertical Stack

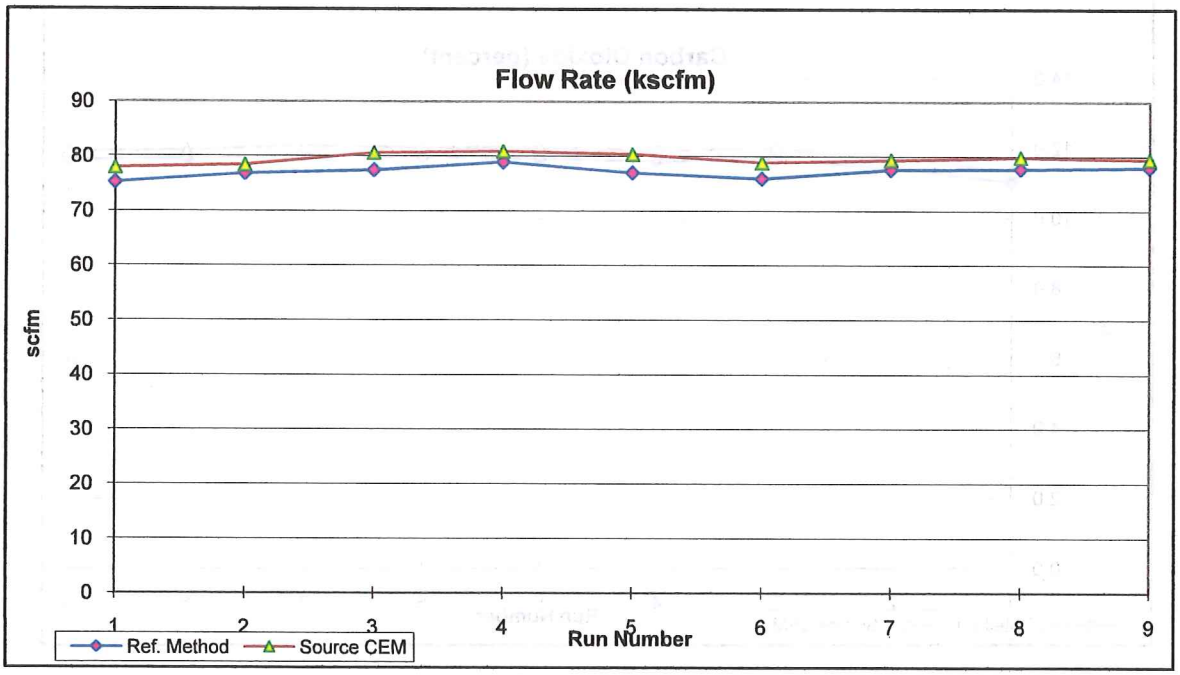
Date: 5/4/15
Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Standard Flow Rate kscfm

Relative Accuracy 3.69 *Limit = 20%*
Confidence Coefficient (CC) 1
Standard Deviation 1

Mean of Difference -2
Mean of Reference Method 77
Mean of Source CEM Values 79

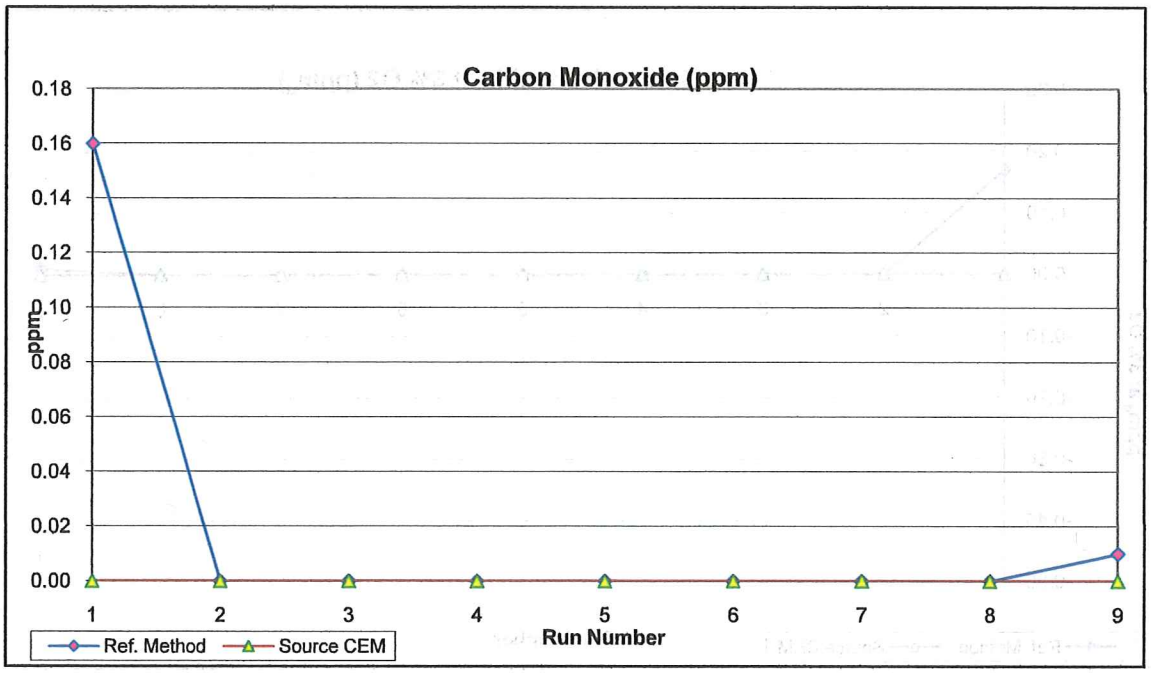


Run	Flag	Initial Minute	Stop Time	Flowrate (kscfm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	8:43	9:04	75.17	77.82	-3			
2	1	9:27	9:48	76.80	78.32	-2	1	1	**4.41**
3	1	10:19	10:40	77.39	80.54	-3	1	1	**4.60**
4	1	11:12	11:33	78.89	80.82	-2	1	1	**4.06**
5	1	12:08	12:29	76.97	80.31	-3	1	1	**4.28**
6	1	12:58	13:19	75.92	78.83	-3	1	1	**4.22**
7	1	13:44	14:05	77.58	79.31	-2	1	1	**4.00**
8	1	14:30	14:51	77.71	79.81	-2	1	1	**3.84**
9	1	15:18	15:39	77.95	79.41	-1	1	1	**3.69**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Monoxide Conc. ppm
Relative Accuracy N/A *Limit = 10%* Mean of Difference 0.019
RA based on Applicable std. 0.01 *Limit = 5%* Applicable Standard 500
Confidence Coefficient (CC) 0.04 Mean of Reference Method 0.019
Standard Deviation 0.05 Mean of Source CEM Values 0.000



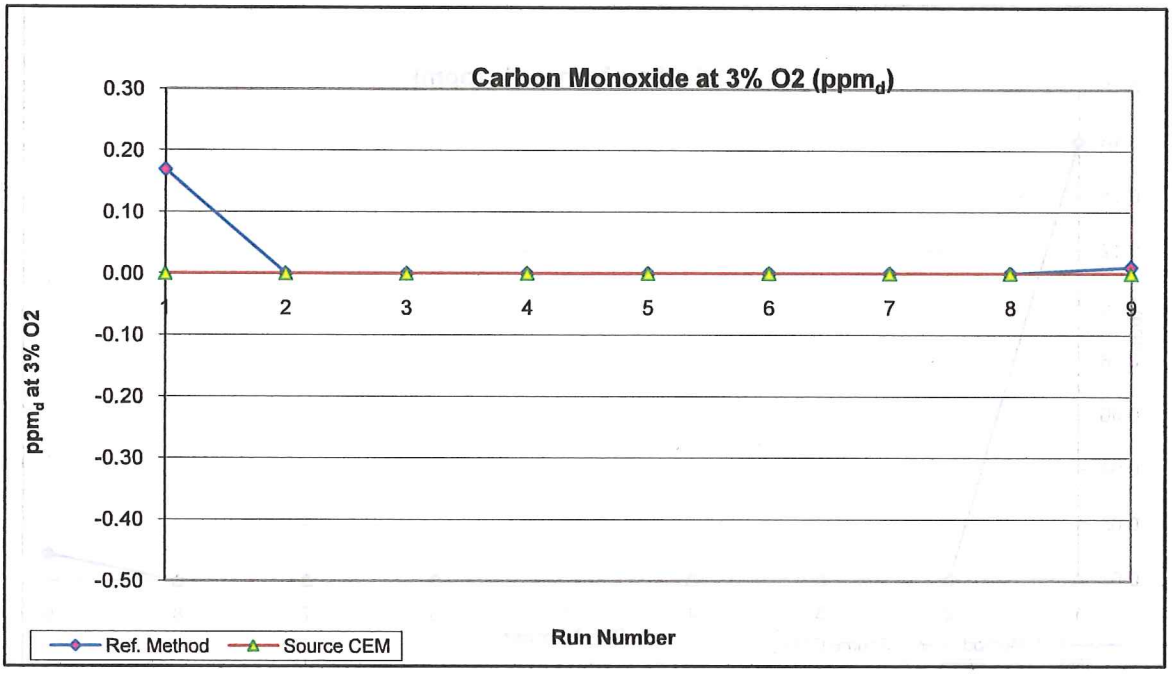
Run	Flag	Initial Minute	Stop Time	Carbon Monoxide (ppm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	0.16	0.00	0.16			
2	1	12:52	13:13	0.00	0.00	0.00	0.11	0.179	**324.14**
3	1	13:44	14:05	0.00	0.00	0.00	0.09	0.120	**324.14**
4	1	14:26	14:47	0.00	0.00	0.00	0.08	0.090	**324.14**
5	1	15:18	15:39	0.00	0.00	0.00	0.07	0.072	**324.14**
6	1	16:03	16:24	0.00	0.00	0.00	0.07	0.060	**324.14**
7	1	16:52	17:13	0.00	0.00	0.00	0.06	0.051	**324.14**
8	1	17:32	17:53	0.00	0.00	0.00	0.06	0.045	**324.14**
9	1	18:14	18:35	0.01	0.00	0.01	0.05	0.040	**309.72**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Monoxide at 3% O2 ppm_d

Relative Accuracy	N/A	*Limit = 10%*	Mean of Difference 0.020
RA based on Applicable std.	0.12	*Limit = 5%*	Applicable Standard 50
Confidence Coefficient (CC)	0.04		Mean of Reference Method 0.020
Standard Deviation	0.06		Mean of Source CEM Values 0.000

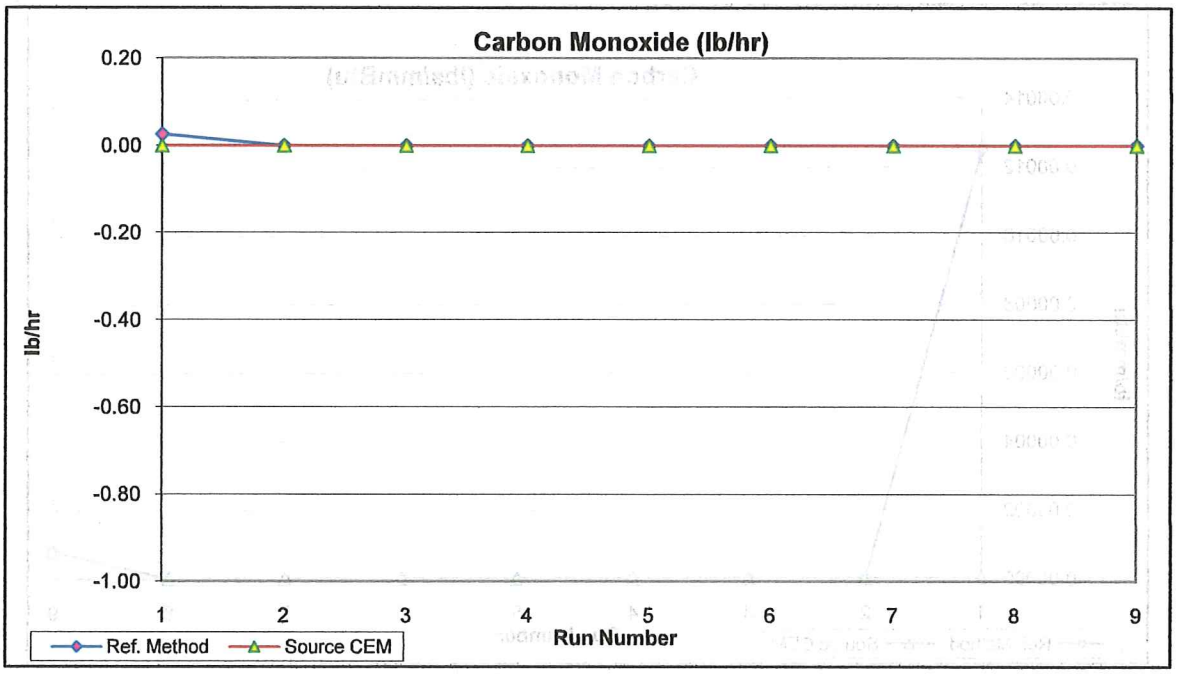


Run	Flag	Initial Minute	Stop Time	Carbon Monoxide at 3% O2 (ppm_d) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	0.17	0.00	0.17			
2	1	12:52	13:13	0.00	0.00	0.00	0.12	0.189	**324.14**
3	1	13:44	14:05	0.00	0.00	0.00	0.10	0.126	**324.14**
4	1	14:26	14:47	0.00	0.00	0.00	0.08	0.095	**324.14**
5	1	15:18	15:39	0.00	0.00	0.00	0.08	0.076	**324.14**
6	1	16:03	16:24	0.00	0.00	0.00	0.07	0.063	**324.14**
7	1	16:52	17:13	0.00	0.00	0.00	0.06	0.054	**324.14**
8	1	17:32	17:53	0.00	0.00	0.00	0.06	0.047	**324.14**
9	1	18:14	18:35	0.01	0.00	0.01	0.06	0.042	**309.56**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Monoxide Emissions lb/hr
Relative Accuracy N/A *Limit = 10%* Mean of Difference 0.003
RA based on Applicable std. 0.04 *Limit = 5%* Applicable Standard 21.6
Confidence Coefficient (CC) 0.01 Mean of Reference Method 0.003
Standard Deviation 0.01 Mean of Source CEM Values 0.000



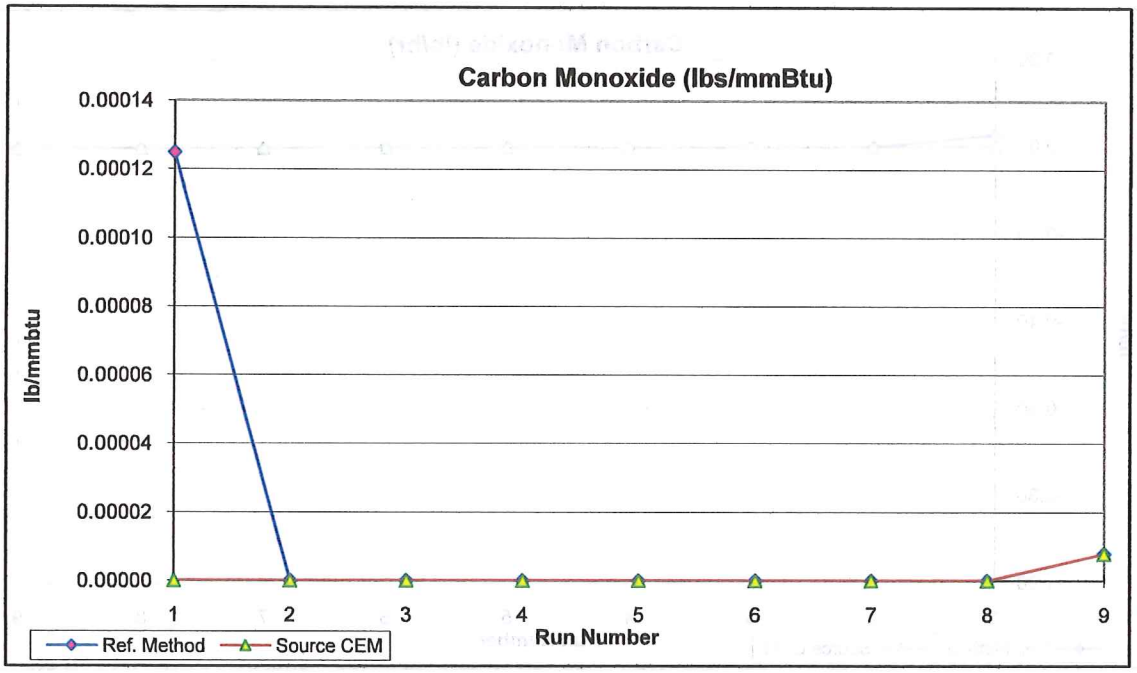
Run	Flag	Initial Minute	Stop Time	Carbon Monoxide (lb/hr) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	0.03	0.00	0.03			
2	1	12:52	13:13	0.00	0.00	0.00	0.02	0.029	**324.14**
3	1	13:44	14:05	0.00	0.00	0.00	0.02	0.019	**324.14**
4	1	14:26	14:47	0.00	0.00	0.00	0.01	0.015	**324.14**
5	1	15:18	15:39	0.00	0.00	0.00	0.01	0.012	**324.14**
6	1	16:03	16:24	0.00	0.00	0.00	0.01	0.010	**324.14**
7	1	16:52	17:13	0.00	0.00	0.00	0.01	0.008	**324.14**
8	1	17:32	17:53	0.00	0.00	0.00	0.01	0.007	**324.14**
9	1	18:14	18:35	0.00	0.00	0.00	0.01	0.006	**323.18**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Carbon Monoxide Emissions lbs/mmBtu

Relative Accuracy	N/A	*Limit = 10%*	Mean of Difference 0.000
RA based on Applicable std.	0.00	*Limit = 5%*	Applicable Standard 381
Confidence Coefficient (CC)	0.00		Mean of Reference Method 0.000
Standard Deviation	0.00		Mean of Source CEM Values 0.000



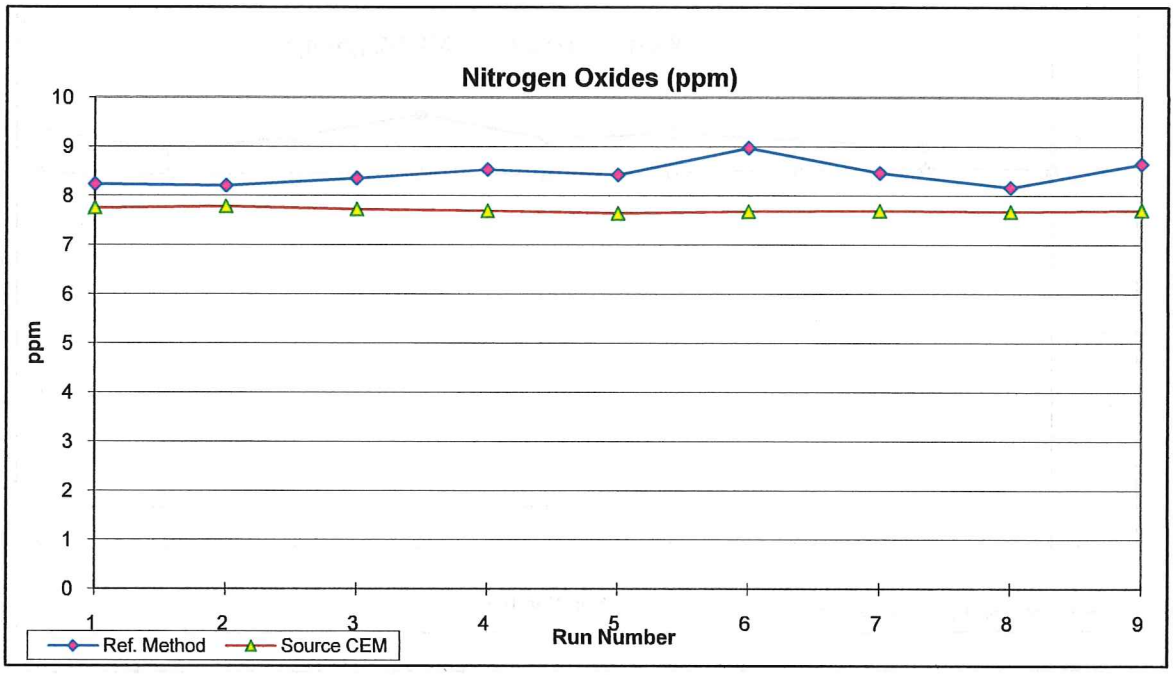
Run	Flag	Initial Minute	Stop Time	Sulfur Dioxide (lb/mmBtu) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	12:04	12:25	0.0001	0.0000	0.00			
2	1	12:52	13:13	0.0000	0.0000	0.00	0.00	0.000	**324.14**
3	1	13:44	14:05	0.0000	0.0000	0.00	0.00	0.000	**324.14**
4	1	14:26	14:47	0.0000	0.0000	0.00	0.00	0.000	**324.14**
5	1	15:18	15:39	0.0000	0.0000	0.00	0.00	0.000	**324.14**
6	1	16:03	16:24	0.0000	0.0000	0.00	0.00	0.000	**324.14**
7	1	16:52	17:13	0.0000	0.0000	0.00	0.00	0.000	**324.14**
8	1	17:32	17:53	0.0000	0.0000	0.00	0.00	0.000	**324.14**
9	1	18:14	18:35	0.0000	0.0000	0.00	0.00	0.000	**304.86**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions ppm

Relative Accuracy	11.15	*Limit = 20%*	Mean of Difference 0.74
RA based on Applicable std.	1.88	*Limit = 10%*	Applicable Standard 50
Confidence Coefficient (CC)	0.20		Mean of Reference Method 8.45
Standard Deviation	0.27		Mean of Source CEM Values 7.71



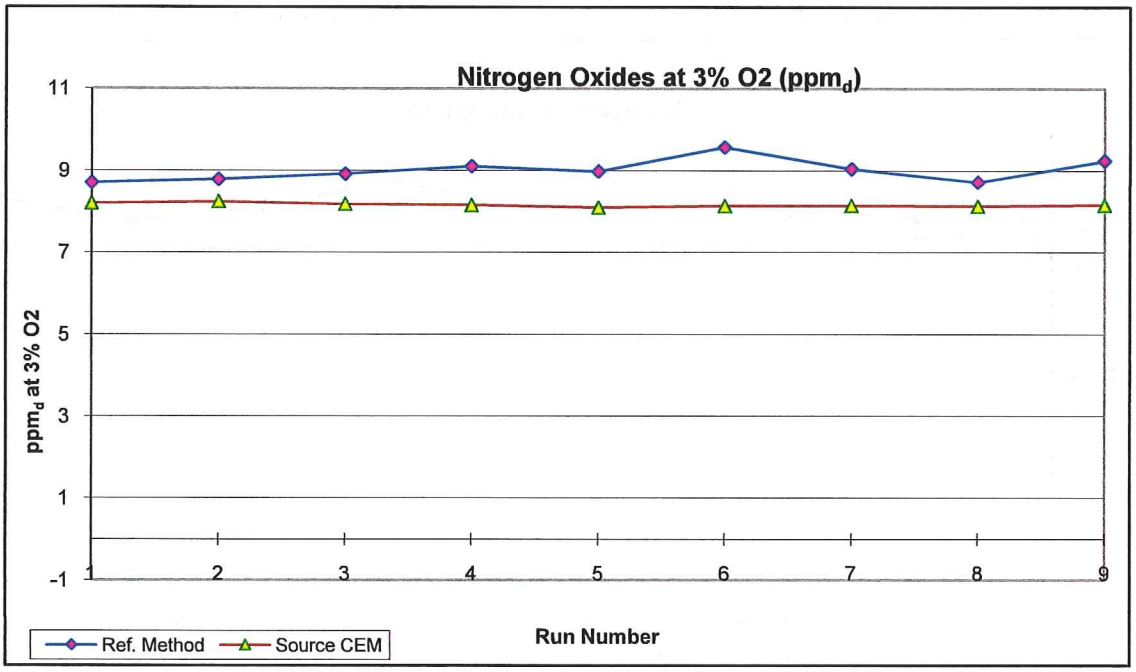
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (ppm) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	8.24	7.76	0.48			
2	1	12:52	13:13	8.21	7.79	0.42	0.04	0.067	**6.29**
3	1	13:44	14:05	8.36	7.73	0.63	0.11	0.140	**7.86**
4	1	14:26	14:47	8.54	7.70	0.84	0.19	0.210	**9.62**
5	1	15:18	15:39	8.43	7.65	0.78	0.18	0.183	**9.73**
6	1	16:03	16:24	8.98	7.69	1.29	0.32	0.288	**12.15**
7	1	16:52	17:13	8.47	7.70	0.77	0.29	0.244	**11.68**
8	1	17:32	17:53	8.17	7.68	0.49	0.28	0.223	**11.10**
9	1	18:14	18:35	8.65	7.71	0.94	0.27	0.205	**11.15**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides at 3% O2 ppm_d

Relative Accuracy 11.90 *Limit – 20%* Mean of Difference 0.847
Confidence Coefficient (CC) 0.22 Mean of Reference Method 9.003
Standard Deviation 0.30 Mean of Source CEM Values 8.156



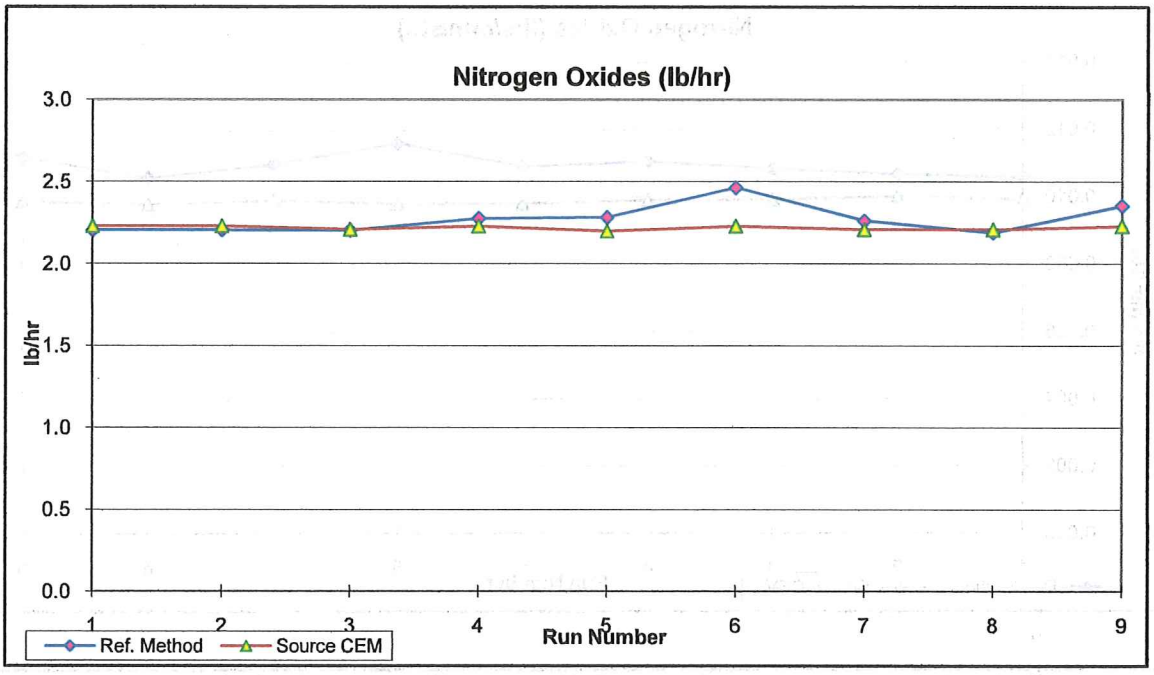
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides at 3% O2 (ppm_d) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	8.70	8.20	0.50			
2	1	12:52	13:13	8.78	8.24	0.54	0.03	0.047	**6.47**
3	1	13:44	14:05	8.91	8.18	0.73	0.13	0.163	**8.55**
4	1	14:26	14:47	9.10	8.15	0.95	0.21	0.232	**10.27**
5	1	15:18	15:39	8.98	8.09	0.89	0.20	0.202	**10.38**
6	1	16:03	16:24	9.57	8.13	1.44	0.34	0.315	**12.83**
7	1	16:52	17:13	9.04	8.14	0.90	0.31	0.267	**12.38**
8	1	17:32	17:53	8.72	8.12	0.60	0.30	0.242	**11.80**
9	1	18:14	18:35	9.24	8.15	1.09	0.30	0.224	**11.90**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lb/hr

Relative Accuracy 5.13	*Limit = 20%*	Mean of Difference 0.05
RA based on Applicable std. 0.76	*Limit = 10%*	Applicable Standard 15.4
Confidence Coefficient (CC) 0.07		Mean of Reference Method 2.27
Standard Deviation 0.09		Mean of Source CEM Values 2.22



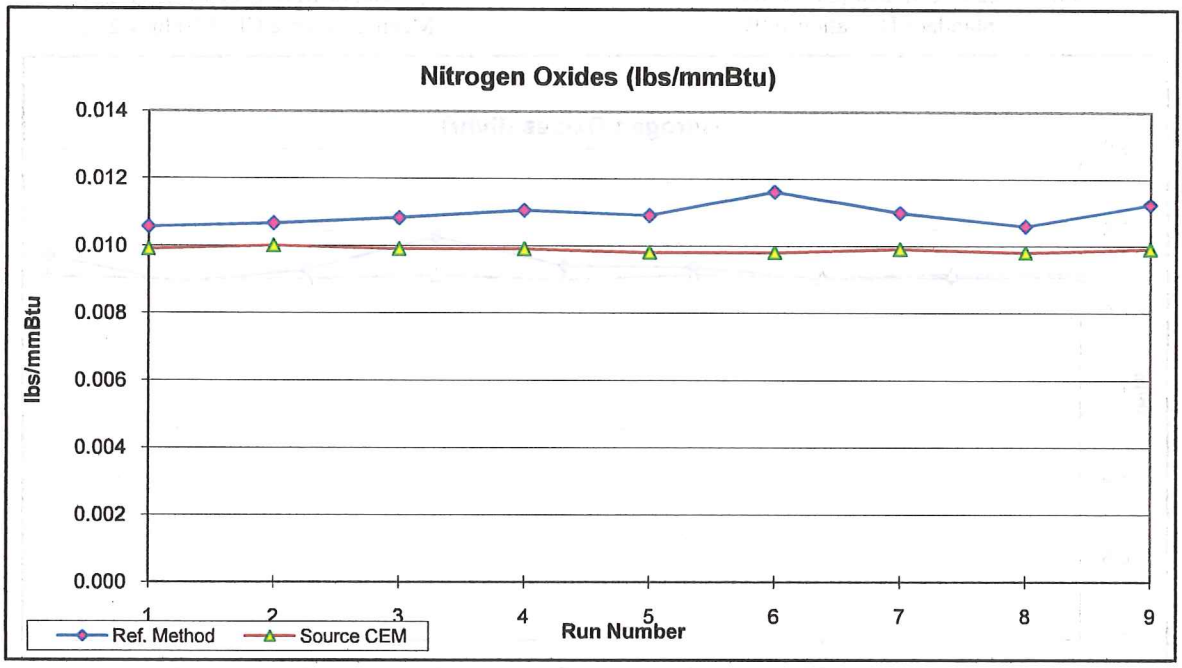
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lb/hr) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	2.20	2.23	-0.03			
2	1	12:52	13:13	2.20	2.23	-0.03	0.00	0.001	**1.22**
3	1	13:44	14:05	2.20	2.21	-0.01	0.01	0.014	**1.53**
4	1	14:26	14:47	2.28	2.23	0.05	0.03	0.039	**1.87**
5	1	15:18	15:39	2.28	2.20	0.08	0.05	0.049	**2.83**
6	1	16:03	16:24	2.47	2.23	0.24	0.10	0.092	**6.28**
7	1	16:52	17:13	2.26	2.21	0.05	0.09	0.077	**5.67**
8	1	17:32	17:53	2.19	2.21	-0.02	0.09	0.070	**4.97**
9	1	18:14	18:35	2.35	2.23	0.12	0.09	0.065	**5.13**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Nitrogen Oxides Emissions lbs/mmBtu

Relative Accuracy 12.15 *Limit = 20%* Mean of Difference 0.0011
Confidence Coefficient (CC) 0.0003 Mean of Reference Method 0.0109
Standard Deviation 0.0004 Mean of Source CEM Values 0.0099



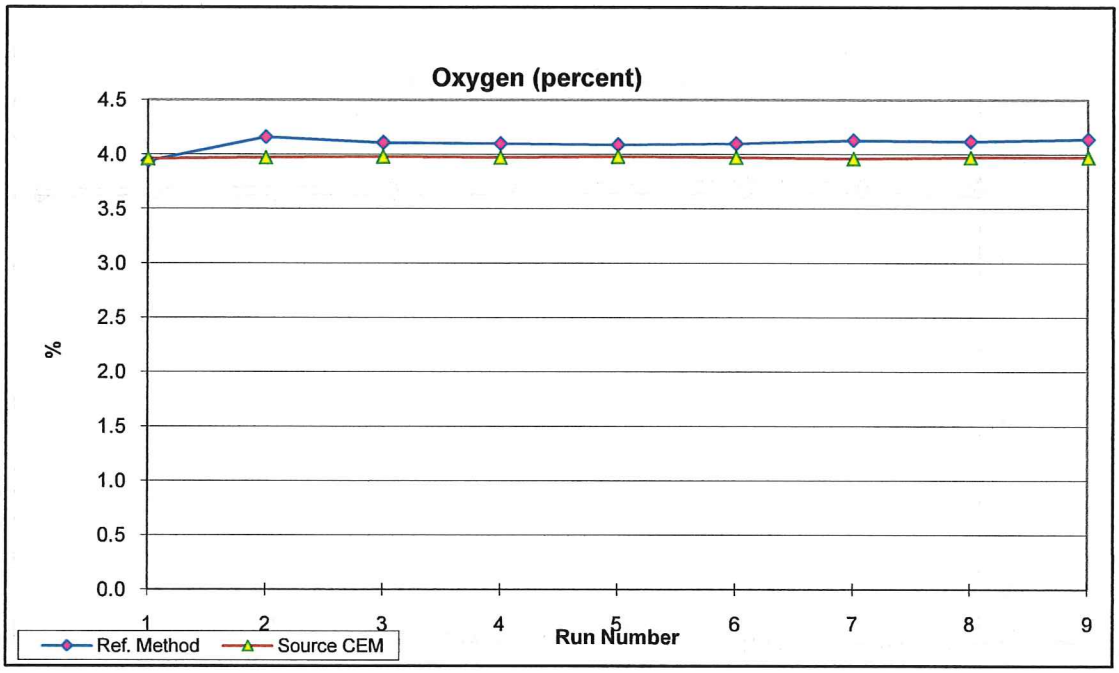
Run	Flag	Initial Minute	Stop Time	Nitrogen Oxides (lbs/mmBtu) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	0.0106	0.0099	0.0007			
2	1	12:52	13:13	0.0107	0.0100	0.0007	0.0000	0.0000	**6.23**
3	1	13:44	14:05	0.0108	0.0099	0.0009	0.0002	0.0002	**8.84**
4	1	14:26	14:47	0.0111	0.0099	0.0012	0.0002	0.0003	**10.33**
5	1	15:18	15:39	0.0109	0.0098	0.0011	0.0002	0.0002	**10.49**
6	1	16:03	16:24	0.0116	0.0098	0.0018	0.0004	0.0004	**13.22**
7	1	16:52	17:13	0.0110	0.0099	0.0011	0.0004	0.0003	**12.69**
8	1	17:32	17:53	0.0106	0.0098	0.0008	0.0004	0.0003	**12.12**
9	1	18:14	18:35	0.0112	0.0099	0.0013	0.0004	0.0003	**12.15**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Oxygen Concentration %

Relative Accuracy 4.26 *Limit = 20%* Mean of Difference 0.129
Confidence Coefficient (CC) 0.05 Mean of Reference Method 4.099
Standard Deviation 0.06 Mean of Source CEM Values 3.970



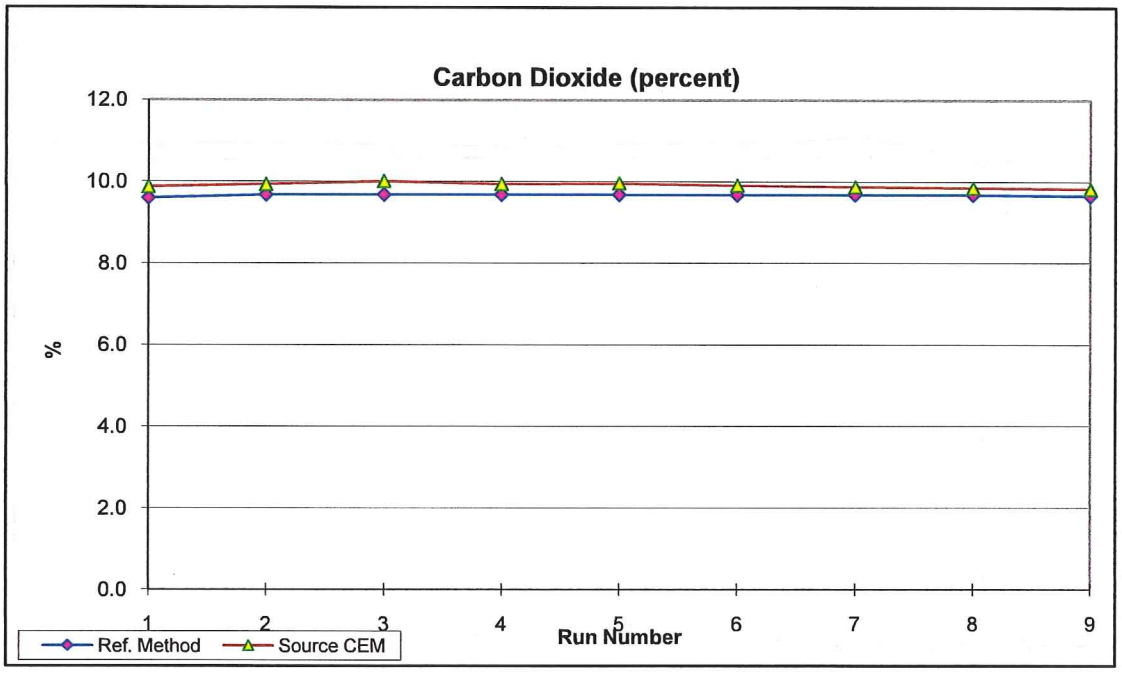
Run	Flag	Initial Minute	Stop Time	Oxygen (percent) Ref. Methoc	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	12:04	12:25	3.94	3.96	-0.02			
2	1	12:52	13:13	4.16	3.97	0.19	0.15	0.235	**7.91**
3	1	13:44	14:05	4.11	3.98	0.13	0.11	0.140	**5.90**
4	1	14:26	14:47	4.10	3.97	0.13	0.09	0.100	**5.10**
5	1	15:18	15:39	4.09	3.98	0.11	0.08	0.078	**4.55**
6	1	16:03	16:24	4.10	3.97	0.13	0.07	0.064	**4.30**
7	1	16:52	17:13	4.13	3.96	0.17	0.07	0.057	**4.33**
8	1	17:32	17:53	4.12	3.97	0.15	0.06	0.050	**4.25**
9	1	18:14	18:35	4.14	3.97	0.17	0.06	0.046	**4.26**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Carbon Dioxide Conc. %

Relative Accuracy	2.90	*Limit = 20%*	Mean of Difference -0.240
Confidence Coefficient (CC)	0.04		Mean of Reference Method 9.654
Standard Deviation	0.05		Mean of Source CEM Values 9.894



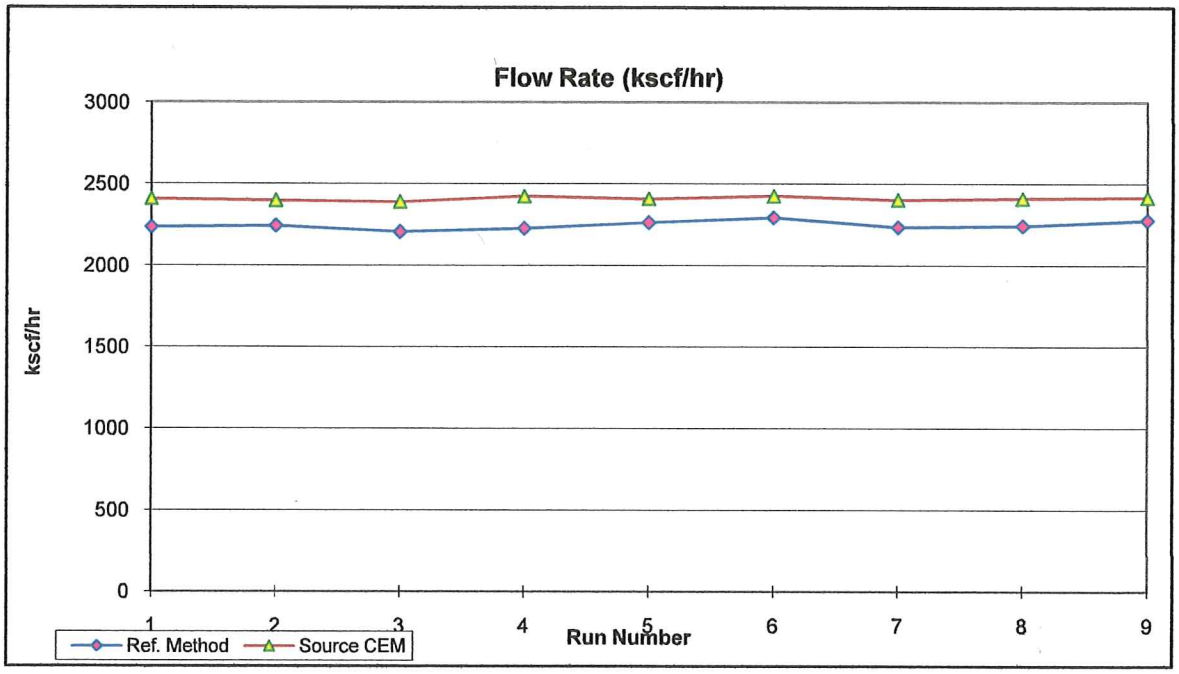
Run	Flag	Initial Minute	Stop Time	Carbon Dioxide (percent) Ref. Method	Source CEM	Difference, d	Standard Deviation	CC	RA
1	1	12:04	12:25	9.59	9.86	-0.27			
2	1	12:52	13:13	9.67	9.92	-0.25	0.01	0.022	**2.93**
3	1	13:44	14:05	9.67	10.00	-0.33	0.04	0.054	**3.50**
4	1	14:26	14:47	9.67	9.93	-0.26	0.04	0.040	**3.29**
5	1	15:18	15:39	9.67	9.95	-0.28	0.03	0.031	**3.20**
6	1	16:03	16:24	9.66	9.90	-0.24	0.03	0.029	**3.12**
7	1	16:52	17:13	9.67	9.86	-0.19	0.04	0.036	**3.06**
8	1	17:32	17:53	9.66	9.83	-0.17	0.05	0.040	**2.99**
9	1	18:14	18:35	9.63	9.80	-0.17	0.05	0.040	**2.90**

Company: Solvay Chemicals
Facility: Green River
Source: BO4 Date: 4/28/15
Location: Vertical Stack Job No.: 1501C

Optimal
AIR TESTING SERVICES, INC

Standard Flow Rate kscf/hr

Relative Accuracy 7.92	*Limit = 20%*	Mean of Difference -162
Confidence Coefficient (CC) 16		Mean of Reference Method 2,249
Standard Deviation 21		Mean of Source CEM Values 2,411



Run	Flag	Initial Minute	Stop Time	Flowrate (kscf/hr) Ref. Method	Source CEM	Difference, d_i	Standard Deviation	CC	RA
1	1	12:04	12:25	2236	2410	-174			
2	1	12:52	13:13	2245	2400	-155	14	21	**8.29**
3	1	13:44	14:05	2209	2392	-183	14	19	**8.48**
4	1	14:26	14:47	2229	2425	-196	17	19	**8.81**
5	1	15:18	15:39	2265	2410	-145	21	21	**8.55**
6	1	16:03	16:24	2296	2428	-133	24	22	**8.29**
7	1	16:52	17:13	2237	2404	-168	22	19	**8.17**
8	1	17:32	17:53	2244	2413	-169	20	16	**8.08**
9	1	18:14	18:35	2279	2418	-139	21	16	**7.92**

Optimal
AIR TESTING SERVICES, INC

APPENDIX B

Reference Method Field Data

BO-1 RATA Run 1

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/29/2015	13:13:14	296.10	6.54	12.09	2.26
4/29/2015	13:14:14	295.68	6.43	12.17	2.02
4/29/2015	13:15:14	295.56	6.48	12.12	1.74
4/29/2015	13:16:14	296.78	6.53	12.07	1.56
4/29/2015	13:17:14	295.24	6.51	12.06	1.43
4/29/2015	13:18:14	293.98	6.50	12.07	1.25
4/29/2015	13:19:14	295.44	6.56	12.00	1.09
4/29/2015	13:20:14	293.89	6.63	11.89	0.97
4/29/2015	13:21:14	291.73	6.57	11.89	0.88
4/29/2015	13:22:14	293.51	6.50	11.96	0.76
4/29/2015	13:23:14	292.42	6.52	11.92	0.57
4/29/2015	13:24:14	293.27	6.59	11.89	0.45
4/29/2015	13:25:14	293.59	6.42	12.05	0.39
4/29/2015	13:26:14	295.21	6.47	12.00	0.37
4/29/2015	13:27:14	295.42	6.44	12.02	0.30
4/29/2015	13:28:14	295.80	6.42	12.04	0.21
4/29/2015	13:29:14	294.10	6.62	11.86	0.14
4/29/2015	13:30:14	291.57	6.50	12.00	0.07
4/29/2015	13:31:14	291.01	6.33	12.15	0.08
4/29/2015	13:32:14	291.34	6.47	11.99	-0.01
4/29/2015	13:33:14	288.90	6.62	11.88	-0.11
	Average:	293.835	6.507	12.006	0.782

BO-1 RATA					Run 2
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/29/2015	14:14:13	300.32	6.58	11.96	1.48
4/29/2015	14:15:13	299.50	6.48	12.10	1.44
4/29/2015	14:16:13	298.73	6.80	12.05	1.22
4/29/2015	14:17:13	298.56	6.59	12.32	1.06
4/29/2015	14:18:13	298.96	6.43	12.45	0.99
4/29/2015	14:19:13	299.00	6.50	12.40	0.91
4/29/2015	14:20:13	298.85	6.47	12.45	0.73
4/29/2015	14:21:13	298.48	6.58	12.35	0.64
4/29/2015	14:22:13	298.54	6.56	12.40	0.46
4/29/2015	14:23:13	299.11	6.37	12.60	0.39
4/29/2015	14:24:13	298.59	6.44	12.49	0.28
4/29/2015	14:25:13	295.16	6.91	12.14	0.25
4/29/2015	14:26:13	295.42	7.03	11.92	0.13
4/29/2015	14:27:13	279.31	7.67	11.40	0.00
4/29/2015	14:28:13	267.93	7.45	11.62	-0.02
4/29/2015	14:29:13	264.92	7.13	11.98	-0.09
4/29/2015	14:30:13	278.05	6.01	13.05	-0.07
4/29/2015	14:31:13	293.52	6.10	12.91	-0.01
4/29/2015	14:32:13	297.96	6.58	12.48	-0.05
4/29/2015	14:33:13	298.64	7.09	12.03	-0.09
4/29/2015	14:34:13	297.32	7.03	12.06	-0.08
	Average:	293.184	6.705	12.246	0.456

BO-1 RATA Run 3

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/29/2015	15:16:33	293.69	6.62	12.42	-0.31
4/29/2015	15:17:34	293.04	6.61	12.44	-0.25
4/29/2015	15:18:33	296.12	6.62	12.44	-0.33
4/29/2015	15:19:34	296.89	6.68	12.36	-0.19
4/29/2015	15:20:33	294.69	6.76	12.32	-0.22
4/29/2015	15:21:33	295.92	6.57	12.48	-0.32
4/29/2015	15:22:33	294.73	6.68	12.38	-0.41
4/29/2015	15:23:33	293.43	6.61	12.47	-0.44
4/29/2015	15:24:33	294.00	6.44	12.60	-0.56
4/29/2015	15:25:33	294.06	6.64	12.43	-0.59
4/29/2015	15:26:34	292.17	6.63	12.43	-0.61
4/29/2015	15:27:33	294.69	6.58	12.48	-0.07
4/29/2015	15:28:34	294.70	6.53	12.53	-0.20
4/29/2015	15:29:33	293.98	6.53	12.52	-0.13
4/29/2015	15:30:34	290.89	6.64	12.43	-0.09
4/29/2015	15:31:33	292.46	6.57	12.51	-0.10
4/29/2015	15:32:33	292.96	6.49	12.58	-0.10
4/29/2015	15:33:33	294.34	6.62	12.45	-0.13
4/29/2015	15:34:33	294.92	6.58	12.48	-0.14
4/29/2015	15:35:33	293.60	6.58	12.49	-0.11
4/29/2015	15:36:33	292.00	6.59	12.49	-0.18
	Average:	293.966	6.599	12.463	-0.261

BO-1 RATA					Run 4
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/29/2015	16:21:33	294.74	6.85	12.27	1.39
4/29/2015	16:22:33	287.61	7.14	12.02	1.21
4/29/2015	16:23:33	288.01	7.13	12.08	1.22
4/29/2015	16:24:33	293.36	6.91	12.27	1.04
4/29/2015	16:25:33	287.42	7.00	12.18	0.77
4/29/2015	16:26:33	285.97	7.32	11.88	0.65
4/29/2015	16:27:33	286.46	7.24	11.99	0.54
4/29/2015	16:28:33	285.58	7.39	11.82	0.38
4/29/2015	16:29:33	280.63	7.44	11.79	0.25
4/29/2015	16:30:33	282.27	7.41	11.86	0.22
4/29/2015	16:31:33	291.39	6.95	12.24	0.13
4/29/2015	16:32:33	293.82	6.94	12.26	0.08
4/29/2015	16:33:33	293.06	6.77	12.38	0.05
4/29/2015	16:34:33	294.67	6.81	12.34	-0.06
4/29/2015	16:35:33	294.27	6.82	12.35	-0.07
4/29/2015	16:36:33	293.83	6.91	12.26	-0.09
4/29/2015	16:37:33	292.75	6.94	12.23	-0.11
4/29/2015	16:38:33	291.48	7.01	12.19	-0.11
4/29/2015	16:39:33	290.15	6.84	12.35	-0.14
4/29/2015	16:40:33	292.12	6.69	12.47	-0.08
4/29/2015	16:41:33	293.06	6.88	12.29	-0.04
	Average:	290.126	7.019	12.168	0.344

BO-1 RATA					Run 5
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/30/2015	7:44:18	286.57	6.95	12.45	2.33
4/30/2015	7:45:18	287.74	6.91	12.49	2.36
4/30/2015	7:46:18	287.54	6.87	12.53	2.33
4/30/2015	7:47:18	287.73	6.82	12.56	2.36
4/30/2015	7:48:18	288.27	6.92	12.46	2.28
4/30/2015	7:49:18	290.25	6.89	12.49	2.28
4/30/2015	7:50:18	291.24	6.88	12.50	2.20
4/30/2015	7:51:18	290.44	6.86	12.53	2.20
4/30/2015	7:52:18	289.18	6.88	12.50	2.18
4/30/2015	7:53:18	289.18	6.88	12.51	2.15
4/30/2015	7:54:18	288.72	6.96	12.43	2.16
4/30/2015	7:55:18	287.84	6.93	12.45	2.13
4/30/2015	7:56:18	287.41	6.97	12.42	2.18
4/30/2015	7:57:18	287.96	7.00	12.40	2.14
4/30/2015	7:58:18	288.80	6.94	12.46	2.15
4/30/2015	7:59:18	289.68	6.88	12.50	2.16
4/30/2015	8:00:18	289.00	6.84	12.55	2.08
4/30/2015	8:01:18	290.44	6.72	12.68	2.07
4/30/2015	8:02:18	290.66	6.67	12.71	2.05
4/30/2015	8:03:18	289.94	6.75	12.63	2.01
4/30/2015	8:04:18	292.41	6.79	12.60	1.99
	Average:	289.095	6.872	12.517	2.180

BO-1 RATA					Run 6
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/30/2015	9:12:18	289.89	6.70	12.60	3.22
4/30/2015	9:13:18	289.72	6.70	12.62	3.14
4/30/2015	9:14:18	290.76	6.58	12.74	3.04
4/30/2015	9:15:18	291.55	6.57	12.74	2.95
4/30/2015	9:16:18	291.12	6.62	12.71	2.91
4/30/2015	9:17:18	291.74	6.65	12.68	2.79
4/30/2015	9:18:18	290.10	6.69	12.65	2.72
4/30/2015	9:19:18	290.96	6.69	12.66	2.66
4/30/2015	9:20:18	290.69	6.67	12.67	2.53
4/30/2015	9:21:18	291.17	6.81	12.51	2.41
4/30/2015	9:22:18	288.87	6.83	12.53	2.35
4/30/2015	9:23:18	289.77	6.69	12.65	2.33
4/30/2015	9:24:18	288.72	6.69	12.65	2.25
4/30/2015	9:25:18	288.97	6.74	12.60	2.23
4/30/2015	9:26:18	290.78	6.74	12.61	2.18
4/30/2015	9:27:18	292.09	6.72	12.66	2.21
4/30/2015	9:28:18	290.22	6.62	12.75	2.16
4/30/2015	9:29:18	288.24	6.57	12.77	2.13
4/30/2015	9:30:18	285.66	6.62	12.73	2.04
4/30/2015	9:31:18	286.14	6.62	12.72	2.07
4/30/2015	9:32:18	287.09	6.73	12.62	2.03
	Average:	289.726	6.679	12.660	2.493

BO-1 RATA					Run 7
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/30/2015	10:24:18	293.55	6.52	12.77	2.40
4/30/2015	10:25:18	293.87	6.61	12.65	2.35
4/30/2015	10:26:18	292.67	6.69	12.57	2.28
4/30/2015	10:27:18	290.21	6.82	12.45	2.26
4/30/2015	10:28:18	289.72	6.84	12.44	2.21
4/30/2015	10:29:18	288.60	6.74	12.53	2.14
4/30/2015	10:30:18	288.21	6.67	12.59	2.15
4/30/2015	10:31:18	289.86	6.64	12.62	2.13
4/30/2015	10:32:18	288.68	6.66	12.60	2.12
4/30/2015	10:33:18	289.50	6.75	12.51	2.12
4/30/2015	10:34:18	290.98	6.78	12.47	2.13
4/30/2015	10:35:18	287.75	6.88	12.39	2.11
4/30/2015	10:36:18	286.70	6.81	12.46	2.04
4/30/2015	10:37:18	286.81	6.73	12.52	2.05
4/30/2015	10:38:18	284.04	6.68	12.56	2.03
4/30/2015	10:39:18	285.83	6.72	12.51	2.04
4/30/2015	10:40:18	284.75	6.76	12.48	2.04
4/30/2015	10:41:18	285.42	6.85	12.41	2.04
4/30/2015	10:42:18	286.61	6.87	12.38	2.00
4/30/2015	10:43:18	284.69	6.87	12.39	1.98
4/30/2015	10:44:18	285.15	6.85	12.40	2.01
	Average:	288.267	6.750	12.510	2.125

BO-1 RATA Run 8

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/30/2015	11:31:18	288.69	6.71	12.13	2.86
4/30/2015	11:32:18	287.84	6.72	12.09	2.83
4/30/2015	11:33:18	287.33	6.72	12.06	2.77
4/30/2015	11:34:18	287.44	6.73	12.03	2.78
4/30/2015	11:35:18	287.07	6.74	12.00	2.72
4/30/2015	11:36:18	286.24	6.74	11.97	2.63
4/30/2015	11:37:18	286.92	6.74	11.94	2.55
4/30/2015	11:38:18	286.84	6.75	11.92	2.38
4/30/2015	11:39:18	289.96	6.75	11.89	2.12
4/30/2015	11:40:18	285.29	6.75	11.87	2.08
4/30/2015	11:41:18	285.26	6.75	11.84	2.00
4/30/2015	11:42:18	285.74	6.75	11.82	2.02
4/30/2015	11:43:18	285.27	6.75	11.79	2.01
4/30/2015	11:44:18	284.41	6.75	11.76	2.00
4/30/2015	11:45:18	284.90	6.74	11.74	1.97
4/30/2015	11:46:18	284.44	6.75	11.72	1.97
4/30/2015	11:47:18	284.97	6.75	11.69	2.03
4/30/2015	11:48:18	284.00	6.75	11.67	1.99
4/30/2015	11:49:18	284.12	6.77	11.73	1.97
4/30/2015	11:50:18	284.37	6.95	12.11	1.97
4/30/2015	11:51:18	284.23	6.89	12.20	2.02
	Average:	285.968	6.760	11.903	2.270

BO-1 RATA					Run 9
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/30/2015	12:35:18	281.11	7.16	11.89	2.76
4/30/2015	12:36:18	281.67	7.19	11.87	2.67
4/30/2015	12:37:18	281.44	7.04	11.98	2.51
4/30/2015	12:38:18	281.46	7.06	11.96	2.43
4/30/2015	12:39:18	280.33	7.12	11.91	2.32
4/30/2015	12:40:18	282.11	7.11	11.92	2.28
4/30/2015	12:41:18	285.01	7.07	11.95	2.24
4/30/2015	12:42:18	284.27	7.01	12.00	2.21
4/30/2015	12:43:18	283.25	7.08	11.92	2.18
4/30/2015	12:44:18	283.26	7.07	11.94	2.14
4/30/2015	12:45:18	282.92	7.05	11.96	2.14
4/30/2015	12:46:18	284.32	7.04	11.96	2.16
4/30/2015	12:47:18	282.74	6.95	12.03	2.10
4/30/2015	12:48:18	284.64	6.85	12.13	2.09
4/30/2015	12:49:18	284.27	6.76	12.19	2.11
4/30/2015	12:50:18	285.38	6.85	12.10	2.07
4/30/2015	12:51:18	284.40	6.82	12.13	2.07
4/30/2015	12:52:18	284.31	6.87	12.09	2.04
4/30/2015	12:53:18	284.36	6.88	12.08	2.04
4/30/2015	12:54:18	284.75	6.78	12.16	2.04
4/30/2015	12:55:18	286.86	6.68	12.27	2.08
	Average:	283.470	6.973	12.021	2.223

BO-2 RATA					Run 1
Date	Time	NOx [ppm	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	8:44:03	269.96	8.50	10.86	2.30
5/4/2015	8:45:03	271.89	8.46	10.87	2.33
5/4/2015	8:46:03	269.00	8.59	10.76	2.22
5/4/2015	8:47:03	267.05	8.60	10.78	2.22
5/4/2015	8:48:03	269.25	8.56	10.83	2.25
5/4/2015	8:49:03	267.90	8.56	10.87	2.24
5/4/2015	8:50:03	267.25	8.55	10.89	2.20
5/4/2015	8:51:03	267.00	8.57	10.81	2.17
5/4/2015	8:52:03	268.92	8.48	10.90	2.22
5/4/2015	8:53:03	269.58	8.46	10.89	2.23
5/4/2015	8:54:03	270.72	8.50	10.87	2.17
5/4/2015	8:55:03	270.11	8.49	10.86	2.17
5/4/2015	8:56:03	269.32	8.52	10.84	2.14
5/4/2015	8:57:03	269.88	8.44	10.93	2.13
5/4/2015	8:58:03	272.60	8.08	11.25	2.12
5/4/2015	8:59:03	273.69	8.02	11.30	2.09
5/4/2015	9:00:03	275.20	8.11	11.19	2.13
5/4/2015	9:01:03	266.16	8.56	10.75	2.06
5/4/2015	9:02:03	263.69	8.61	10.70	2.01
5/4/2015	9:03:03	258.07	9.02	10.34	1.98
5/4/2015	9:04:03	254.27	9.04	10.32	1.92
	Average:	268.167	8.510	10.848	2.157

BO-2 RATA Run 2

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	9:28:03	270.88	8.06	11.23	2.45
5/4/2015	9:29:03	270.92	8.07	11.21	2.34
5/4/2015	9:30:03	270.39	8.03	11.24	2.31
5/4/2015	9:31:03	270.35	8.04	11.23	2.28
5/4/2015	9:32:03	270.85	8.01	11.26	2.24
5/4/2015	9:33:03	271.58	7.91	11.33	2.17
5/4/2015	9:34:03	269.56	7.94	11.31	2.12
5/4/2015	9:35:03	269.82	7.94	11.29	2.18
5/4/2015	9:36:03	269.66	8.02	11.20	2.10
5/4/2015	9:37:03	267.95	8.02	11.19	2.06
5/4/2015	9:38:03	267.54	8.04	11.17	2.02
5/4/2015	9:39:03	268.26	8.05	11.17	2.02
5/4/2015	9:40:03	269.33	7.99	11.22	1.99
5/4/2015	9:41:03	268.88	8.02	11.20	2.02
5/4/2015	9:42:03	268.24	8.08	11.15	1.95
5/4/2015	9:43:03	269.13	8.13	11.11	1.91
5/4/2015	9:44:03	268.35	8.05	11.19	1.94
5/4/2015	9:45:03	267.49	8.11	11.14	1.91
5/4/2015	9:46:03	267.92	8.08	11.18	1.94
5/4/2015	9:47:03	268.95	7.93	11.30	1.95
5/4/2015	9:48:03	267.52	8.10	11.14	1.89
	Average:	269.218	8.030	11.212	2.085

BO-2 RATA					Run 3
Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	10:20:03	267.45	7.44	11.45	2.53
5/4/2015	10:21:03	268.37	7.48	11.42	2.50
5/4/2015	10:22:03	267.89	7.49	11.43	2.42
5/4/2015	10:23:03	268.19	7.48	11.44	2.38
5/4/2015	10:24:03	268.27	7.69	11.41	2.35
5/4/2015	10:25:03	270.28	7.67	11.46	2.33
5/4/2015	10:26:03	267.93	7.63	11.50	2.32
5/4/2015	10:27:03	267.18	7.72	11.43	2.32
5/4/2015	10:28:03	269.97	7.69	11.45	2.29
5/4/2015	10:29:03	271.53	7.67	11.48	2.36
5/4/2015	10:30:03	270.15	7.75	11.43	2.37
5/4/2015	10:31:03	269.00	7.64	11.51	2.39
5/4/2015	10:32:03	267.50	7.71	11.44	2.37
5/4/2015	10:33:03	269.05	7.71	11.44	2.36
5/4/2015	10:34:03	268.75	7.72	11.43	2.39
5/4/2015	10:35:03	267.69	7.74	11.43	2.36
5/4/2015	10:36:03	267.81	7.75	11.41	2.42
5/4/2015	10:37:03	267.87	7.76	11.41	2.45
5/4/2015	10:38:03	268.38	7.73	11.43	2.47
5/4/2015	10:39:03	268.59	7.74	11.44	2.51
5/4/2015	10:40:03	268.11	7.72	11.45	2.49
	Average:	268.570	7.663	11.442	2.399

BO-2 RATA Run 4

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	11:13:03	264.53	7.57	11.28	3.50
5/4/2015	11:14:03	264.94	7.58	11.30	3.62
5/4/2015	11:15:03	265.22	7.61	11.30	3.66
5/4/2015	11:16:03	267.40	7.77	11.28	3.43
5/4/2015	11:17:03	266.50	7.77	11.32	3.26
5/4/2015	11:18:03	265.96	7.77	11.33	3.43
5/4/2015	11:19:03	265.45	7.81	11.28	3.58
5/4/2015	11:20:03	265.30	7.83	11.29	3.24
5/4/2015	11:21:03	266.29	7.75	11.34	3.30
5/4/2015	11:22:03	266.47	7.83	11.27	3.52
5/4/2015	11:23:03	267.05	7.79	11.32	3.61
5/4/2015	11:24:03	267.62	7.57	11.54	3.62
5/4/2015	11:25:03	268.33	7.49	11.57	3.59
5/4/2015	11:26:03	269.78	7.53	11.56	3.58
5/4/2015	11:27:03	269.83	7.49	11.59	3.70
5/4/2015	11:28:03	268.17	7.70	11.37	3.80
5/4/2015	11:29:03	268.00	7.94	11.17	3.89
5/4/2015	11:30:03	266.79	7.81	11.28	3.86
5/4/2015	11:31:03	266.77	7.78	11.30	3.95
5/4/2015	11:32:03	266.23	7.87	11.22	3.93
5/4/2015	11:33:03	267.26	7.64	11.44	3.97
	Average:	266.852	7.710	11.350	3.621

BO-2 RATA Run 5

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	12:09:03	268.46	7.32	11.48	4.66
5/4/2015	12:10:03	266.54	7.68	11.21	4.50
5/4/2015	12:11:03	266.33	7.59	11.34	4.60
5/4/2015	12:12:03	265.68	7.44	11.47	4.55
5/4/2015	12:13:03	264.71	7.43	11.48	4.62
5/4/2015	12:14:03	264.89	7.47	11.43	4.44
5/4/2015	12:15:03	265.65	7.46	11.47	4.22
5/4/2015	12:16:03	266.41	7.44	11.49	4.39
5/4/2015	12:17:03	266.14	7.44	11.48	4.46
5/4/2015	12:18:03	266.16	7.48	11.45	4.49
5/4/2015	12:19:03	264.66	7.56	11.37	4.65
5/4/2015	12:20:03	264.09	7.52	11.40	4.71
5/4/2015	12:21:03	263.48	7.56	11.36	4.75
5/4/2015	12:22:03	263.81	7.50	11.41	4.78
5/4/2015	12:23:03	262.70	7.55	11.35	4.82
5/4/2015	12:24:03	261.12	7.55	11.35	4.77
5/4/2015	12:25:03	260.85	7.59	11.31	4.44
5/4/2015	12:26:03	260.83	7.58	11.33	4.12
5/4/2015	12:27:03	262.89	7.53	11.39	4.19
5/4/2015	12:28:03	263.28	7.60	11.32	4.34
5/4/2015	12:29:03	265.09	7.54	11.38	4.46
	Average:	264.465	7.516	11.394	4.522

BO-2 RATA Run 6

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	12:59:03	262.82	7.85	11.27	4.18
5/4/2015	13:00:03	263.50	7.82	11.36	4.79
5/4/2015	13:01:03	264.15	7.86	11.35	5.40
5/4/2015	13:02:03	263.77	7.82	11.39	5.55
5/4/2015	13:03:03	263.50	7.81	11.42	5.46
5/4/2015	13:04:03	265.11	7.85	11.39	5.03
5/4/2015	13:05:03	263.90	7.84	11.39	4.83
5/4/2015	13:06:03	265.14	7.84	11.42	4.65
5/4/2015	13:07:03	264.42	7.85	11.41	4.83
5/4/2015	13:08:03	264.71	7.84	11.41	4.99
5/4/2015	13:09:03	264.52	7.81	11.45	5.10
5/4/2015	13:10:03	265.84	7.85	11.43	5.02
5/4/2015	13:11:03	264.91	7.83	11.43	5.19
5/4/2015	13:12:03	266.56	7.83	11.44	5.31
5/4/2015	13:13:03	265.09	7.91	11.38	5.39
5/4/2015	13:14:03	264.12	7.81	11.47	5.52
5/4/2015	13:15:03	265.95	7.82	11.47	5.27
5/4/2015	13:16:03	265.88	7.77	11.54	5.03
5/4/2015	13:17:03	266.57	7.57	11.69	5.19
5/4/2015	13:18:03	266.01	7.60	11.66	5.44
5/4/2015	13:19:03	265.03	7.65	11.61	5.60
	Average:	264.833	7.801	11.447	5.132

BO-2 RATA Run 7

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	13:45:03	263.72	7.43	11.52	5.55
5/4/2015	13:46:03	262.03	7.52	11.48	6.10
5/4/2015	13:47:03	261.02	7.51	11.49	6.32
5/4/2015	13:48:03	261.72	7.52	11.51	5.75
5/4/2015	13:49:03	262.91	7.69	11.44	5.64
5/4/2015	13:50:03	261.29	7.72	11.50	6.00
5/4/2015	13:51:03	261.93	7.76	11.47	6.15
5/4/2015	13:52:03	261.80	7.80	11.46	6.21
5/4/2015	13:53:03	261.74	7.80	11.42	6.19
5/4/2015	13:54:03	262.24	7.86	11.39	5.99
5/4/2015	13:55:03	262.13	7.86	11.39	5.79
5/4/2015	13:56:03	263.47	7.82	11.41	5.85
5/4/2015	13:57:03	261.95	7.81	11.43	5.57
5/4/2015	13:58:03	258.85	7.87	11.38	5.02
5/4/2015	13:59:03	260.45	7.39	11.83	5.64
5/4/2015	14:00:03	261.60	7.04	12.10	6.07
5/4/2015	14:01:03	262.83	7.27	11.90	5.99
5/4/2015	14:02:03	264.05	7.33	11.84	5.79
5/4/2015	14:03:03	263.29	7.29	11.87	5.37
5/4/2015	14:04:03	265.31	7.56	11.61	5.07
5/4/2015	14:05:03	262.26	7.85	11.36	4.85
	Average:	262.219	7.605	11.562	5.758

BO-2 RATA Run 8

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	14:31:03	259.96	7.67	11.56	6.17
5/4/2015	14:32:03	260.30	7.70	11.53	5.60
5/4/2015	14:33:03	259.70	7.68	11.56	5.59
5/4/2015	14:34:03	260.82	7.64	11.58	6.06
5/4/2015	14:35:03	259.70	7.64	11.58	6.28
5/4/2015	14:36:03	260.25	7.75	11.44	6.36
5/4/2015	14:37:03	261.23	7.75	11.45	6.56
5/4/2015	14:38:03	261.65	7.67	11.51	6.51
5/4/2015	14:39:03	259.77	7.73	11.45	6.22
5/4/2015	14:40:03	258.72	7.72	11.47	6.20
5/4/2015	14:41:03	258.77	7.69	11.49	6.32
5/4/2015	14:42:03	259.48	7.75	11.43	6.28
5/4/2015	14:43:03	259.19	7.72	11.46	6.38
5/4/2015	14:44:03	259.23	7.73	11.44	6.23
5/4/2015	14:45:03	259.60	7.78	11.41	6.10
5/4/2015	14:46:03	261.52	7.67	11.50	5.94
5/4/2015	14:47:03	260.66	7.61	11.55	5.83
5/4/2015	14:48:03	261.63	7.65	11.52	5.52
5/4/2015	14:49:03	261.52	7.66	11.50	5.62
5/4/2015	14:50:03	261.08	7.70	11.47	5.79
5/4/2015	14:51:03	261.64	7.71	11.47	5.82
	Average:	260.306	7.696	11.494	6.066

BO-2 RATA Run 9

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
5/4/2015	15:19:03	261.12	7.59	11.39	2.94
5/4/2015	15:20:03	260.83	7.63	11.37	2.93
5/4/2015	15:21:03	260.93	7.61	11.40	2.74
5/4/2015	15:22:03	261.85	7.54	11.46	2.62
5/4/2015	15:23:03	259.97	7.70	11.46	2.43
5/4/2015	15:24:03	260.88	7.75	11.45	2.27
5/4/2015	15:25:03	260.02	7.80	11.42	2.15
5/4/2015	15:26:03	262.04	7.80	11.43	2.12
5/4/2015	15:27:03	262.19	7.80	11.42	2.00
5/4/2015	15:28:03	261.91	7.72	11.50	1.97
5/4/2015	15:29:03	262.35	7.74	11.47	1.98
5/4/2015	15:30:03	259.37	7.78	11.44	1.91
5/4/2015	15:31:03	259.31	7.76	11.46	1.89
5/4/2015	15:32:03	256.96	7.78	11.44	1.83
5/4/2015	15:33:03	257.50	7.71	11.52	1.81
5/4/2015	15:34:03	258.34	7.79	11.43	1.89
5/4/2015	15:35:03	258.45	7.79	11.45	1.80
5/4/2015	15:36:03	260.31	7.82	11.41	1.78
5/4/2015	15:37:03	259.78	7.85	11.40	1.80
5/4/2015	15:38:03	260.25	7.83	11.43	1.79
5/4/2015	15:39:03	259.45	7.85	11.40	1.77
	Average:	260.181	7.745	11.436	2.115

BO-4 RATA Run 1

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	12:05:48	8.17	0.62	3.74	9.42
4/28/2015	12:06:48	8.37	0.58	3.75	9.43
4/28/2015	12:07:48	8.42	0.62	3.80	9.42
4/28/2015	12:08:48	8.41	0.57	3.79	9.43
4/28/2015	12:09:48	8.46	0.65	3.75	9.47
4/28/2015	12:10:48	8.56	0.60	3.76	9.46
4/28/2015	12:11:48	8.74	0.58	3.71	9.48
4/28/2015	12:12:48	8.75	0.67	3.77	9.45
4/28/2015	12:13:48	8.29	0.77	3.92	9.40
4/28/2015	12:14:48	8.01	0.41	4.06	9.37
4/28/2015	12:15:48	8.01	0.45	4.04	9.39
4/28/2015	12:16:48	8.27	0.38	3.96	9.44
4/28/2015	12:17:48	8.28	0.37	3.95	9.45
4/28/2015	12:18:48	8.25	0.40	3.94	9.45
4/28/2015	12:19:48	8.42	0.38	3.95	9.45
4/28/2015	12:20:48	8.42	0.55	3.96	9.45
4/28/2015	12:21:48	8.50	0.11	3.96	9.45
4/28/2015	12:22:48	8.28	0.10	3.99	9.43
4/28/2015	12:23:48	8.42	0.12	3.97	9.44
4/28/2015	12:24:48	8.34	0.12	3.99	9.44
4/28/2015	12:25:48	8.30	0.11	3.98	9.44
	Average:	8.365	0.436	3.892	9.436

BO-4 RATA					Run 2
Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	12:53:48	8.25	0.18	4.05	9.52
4/28/2015	12:54:48	8.27	0.18	4.04	9.50
4/28/2015	12:55:48	8.40	0.14	4.01	9.52
4/28/2015	12:56:48	8.41	0.12	4.00	9.52
4/28/2015	12:57:48	8.29	0.13	3.97	9.53
4/28/2015	12:58:48	8.50	0.13	3.95	9.52
4/28/2015	12:59:48	8.39	0.14	3.97	9.51
4/28/2015	13:00:48	8.28	0.13	3.99	9.47
4/28/2015	13:01:48	8.49	0.10	4.01	9.43
4/28/2015	13:02:48	8.30	0.09	4.01	9.43
4/28/2015	13:03:48	8.43	0.07	4.00	9.43
4/28/2015	13:04:48	8.29	0.05	4.01	9.42
4/28/2015	13:05:48	8.25	0.05	4.02	9.42
4/28/2015	13:06:48	8.23	0.05	4.00	9.42
4/28/2015	13:07:48	8.42	0.05	3.97	9.44
4/28/2015	13:08:48	8.35	0.04	3.96	9.44
4/28/2015	13:09:48	8.36	0.05	3.98	9.43
4/28/2015	13:10:48	8.15	0.04	4.06	9.37
4/28/2015	13:11:48	8.10	0.04	4.08	9.37
4/28/2015	13:12:48	8.03	0.05	4.08	9.37
4/28/2015	13:13:48	8.20	0.05	4.03	9.40
	Average:	8.304	0.090	4.009	9.450

BO-4 RATA Run 3

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	13:45:48	8.12	0.05	3.94	9.49
4/28/2015	13:46:48	8.29	0.06	3.86	9.54
4/28/2015	13:47:48	8.32	0.04	3.84	9.53
4/28/2015	13:48:48	8.28	0.04	3.85	9.52
4/28/2015	13:49:48	8.33	0.03	3.88	9.49
4/28/2015	13:50:48	8.29	0.04	3.88	9.49
4/28/2015	13:51:48	8.34	0.04	3.88	9.47
4/28/2015	13:52:48	8.32	0.04	3.89	9.44
4/28/2015	13:53:48	8.27	0.02	3.93	9.41
4/28/2015	13:54:48	8.25	0.05	3.96	9.39
4/28/2015	13:55:48	8.17	0.03	3.97	9.38
4/28/2015	13:56:48	8.41	0.04	3.90	9.43
4/28/2015	13:57:48	8.48	0.04	3.88	9.43
4/28/2015	13:58:48	8.45	0.03	3.92	9.41
4/28/2015	13:59:48	8.14	0.06	3.99	9.35
4/28/2015	14:00:48	7.95	0.04	4.05	9.32
4/28/2015	14:01:48	8.29	0.04	3.93	9.39
4/28/2015	14:02:48	8.28	0.04	3.93	9.39
4/28/2015	14:03:48	8.48	0.04	3.89	9.41
4/28/2015	14:04:48	8.51	0.04	3.89	9.41
4/28/2015	14:05:48	8.49	0.04	3.87	9.43
	Average:	8.308	0.040	3.911	9.434

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BO-4 RATA					Run 4
Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	14:27:48	8.46	0.07	3.96	9.49
4/28/2015	14:28:48	8.42	0.05	3.94	9.46
4/28/2015	14:29:48	8.51	0.04	3.95	9.44
4/28/2015	14:30:48	8.33	0.03	3.95	9.44
4/28/2015	14:31:48	8.49	0.03	3.87	9.49
4/28/2015	14:32:48	8.75	0.04	3.82	9.50
4/28/2015	14:33:48	8.91	0.05	3.78	9.51
4/28/2015	14:34:48	8.92	0.03	3.79	9.51
4/28/2015	14:35:48	8.70	0.03	3.85	9.44
4/28/2015	14:36:48	8.70	0.07	3.91	9.39
4/28/2015	14:37:48	8.48	0.04	3.95	9.35
4/28/2015	14:38:48	8.41	0.03	4.02	9.31
4/28/2015	14:39:48	8.55	0.04	3.95	9.35
4/28/2015	14:40:48	8.73	0.05	3.89	9.39
4/28/2015	14:41:48	8.65	0.04	3.81	9.43
4/28/2015	14:42:48	8.80	0.04	3.83	9.41
4/28/2015	14:43:48	8.60	0.03	3.86	9.39
4/28/2015	14:44:48	8.33	0.05	3.92	9.35
4/28/2015	14:45:48	8.32	0.03	3.95	9.33
4/28/2015	14:46:48	8.35	0.01	3.92	9.35
4/28/2015	14:47:48	8.40	0.03	3.87	9.38
	Average:	8.562	0.040	3.895	9.415

BO-4 RATA Run 5

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	15:19:48	8.82	0.02	3.88	9.49
4/28/2015	15:20:48	8.86	0.02	3.86	9.48
4/28/2015	15:21:48	8.81	0.02	3.86	9.47
4/28/2015	15:22:48	8.71	0.04	3.88	9.44
4/28/2015	15:23:48	8.75	0.00	3.87	9.45
4/28/2015	15:24:48	8.81	0.00	3.85	9.46
4/28/2015	15:25:48	8.80	0.01	3.84	9.47
4/28/2015	15:26:48	8.85	0.03	3.86	9.42
4/28/2015	15:27:48	8.83	0.01	3.88	9.38
4/28/2015	15:28:48	8.94	0.00	3.88	9.37
4/28/2015	15:29:48	8.81	-0.02	3.88	9.37
4/28/2015	15:30:48	8.78	0.01	3.91	9.36
4/28/2015	15:31:48	8.82	0.00	3.89	9.37
4/28/2015	15:32:48	8.80	-0.02	3.89	9.37
4/28/2015	15:33:48	8.67	-0.03	3.89	9.36
4/28/2015	15:34:48	8.73	-0.01	3.89	9.37
4/28/2015	15:35:48	8.82	-0.04	3.92	9.35
4/28/2015	15:36:48	8.84	-0.03	3.90	9.36
4/28/2015	15:37:48	8.73	-0.03	3.91	9.35
4/28/2015	15:38:48	8.97	-0.06	3.89	9.36
4/28/2015	15:39:48	8.87	-0.02	3.84	9.39
	Average:	8.810	-0.005	3.880	9.402

BO-4 RATA Run 6

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	16:04:48	9.28	-0.08	3.91	9.46
4/28/2015	16:05:48	9.20	-0.03	3.89	9.45
4/28/2015	16:06:48	9.27	-0.07	3.88	9.45
4/28/2015	16:07:48	9.26	-0.09	3.87	9.44
4/28/2015	16:08:48	9.12	-0.07	3.87	9.44
4/28/2015	16:09:48	9.27	-0.09	3.86	9.45
4/28/2015	16:10:48	9.30	-0.11	3.85	9.45
4/28/2015	16:11:48	9.32	-0.09	3.88	9.39
4/28/2015	16:12:48	9.27	-0.07	3.91	9.36
4/28/2015	16:13:48	9.27	-0.09	3.92	9.34
4/28/2015	16:14:48	9.28	-0.06	3.89	9.37
4/28/2015	16:15:48	9.42	-0.07	3.90	9.34
4/28/2015	16:16:48	9.32	-0.11	3.91	9.34
4/28/2015	16:17:48	9.20	-0.12	3.95	9.31
4/28/2015	16:18:48	9.24	-0.14	3.95	9.31
4/28/2015	16:19:48	9.35	-0.13	3.93	9.32
4/28/2015	16:20:48	9.28	-0.08	3.92	9.32
4/28/2015	16:21:48	9.47	-0.08	3.91	9.34
4/28/2015	16:22:48	9.34	-0.18	3.87	9.36
4/28/2015	16:23:48	9.43	-0.11	3.87	9.36
4/28/2015	16:24:48	9.47	-0.25	3.87	9.36
	Average:	9.303	-0.101	3.896	9.379

BO-4 RATA Run 7

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	16:53:48	8.40	-0.17	3.92	9.46
4/28/2015	16:54:48	8.59	-0.11	3.91	9.44
4/28/2015	16:55:48	8.53	-0.13	3.90	9.44
4/28/2015	16:56:48	8.46	0.00	3.93	9.42
4/28/2015	16:57:48	8.43	0.03	3.93	9.42
4/28/2015	16:58:48	8.34	0.06	3.92	9.42
4/28/2015	16:59:48	8.42	0.06	3.92	9.43
4/28/2015	17:00:48	8.52	0.05	3.94	9.37
4/28/2015	17:01:48	8.52	0.04	3.93	9.36
4/28/2015	17:02:48	8.58	0.05	3.92	9.36
4/28/2015	17:03:48	8.59	0.04	3.93	9.36
4/28/2015	17:04:48	8.49	0.04	3.94	9.35
4/28/2015	17:05:48	8.46	0.04	3.98	9.33
4/28/2015	17:06:48	8.17	0.05	4.06	9.28
4/28/2015	17:07:48	8.20	0.04	4.00	9.32
4/28/2015	17:08:48	8.42	0.04	3.98	9.32
4/28/2015	17:09:48	8.47	0.05	3.95	9.35
4/28/2015	17:10:48	8.45	0.04	3.92	9.36
4/28/2015	17:11:48	8.48	0.05	3.90	9.37
4/28/2015	17:12:48	8.44	0.05	3.91	9.37
4/28/2015	17:13:48	8.29	0.04	3.92	9.36
	Average:	8.440	0.017	3.939	9.376

BO-4 RATA Run 8

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	17:33:48	7.95	-0.10	3.94	9.47
4/28/2015	17:34:48	7.77	-0.12	3.97	9.42
4/28/2015	17:35:48	8.01	-0.09	3.91	9.45
4/28/2015	17:36:48	8.04	-0.08	3.89	9.45
4/28/2015	17:37:48	8.14	-0.10	3.86	9.46
4/28/2015	17:38:48	8.07	-0.08	3.84	9.47
4/28/2015	17:39:48	7.92	-0.09	3.89	9.42
4/28/2015	17:40:48	7.65	-0.11	4.01	9.34
4/28/2015	17:41:48	7.62	-0.10	4.03	9.31
4/28/2015	17:42:48	7.94	-0.11	3.95	9.33
4/28/2015	17:43:48	8.06	-0.16	3.87	9.38
4/28/2015	17:44:48	8.30	-0.13	3.82	9.40
4/28/2015	17:45:48	8.28	-0.17	3.82	9.40
4/28/2015	17:46:48	7.86	-0.17	3.90	9.33
4/28/2015	17:47:48	7.79	-0.11	3.96	9.31
4/28/2015	17:48:48	7.72	-0.13	4.02	9.26
4/28/2015	17:49:48	7.65	-0.09	4.05	9.27
4/28/2015	17:50:48	7.67	-0.15	4.02	9.28
4/28/2015	17:51:48	7.80	-0.14	4.00	9.28
4/28/2015	17:52:48	8.06	-0.18	3.88	9.37
4/28/2015	17:53:48	8.28	-0.16	3.84	9.38
	Average:	7.932	-0.122	3.927	9.370

BO-4 RATA Run 9

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]
4/28/2015	18:15:48	8.16	-0.03	3.98	9.43
4/28/2015	18:16:48	8.12	-0.06	3.97	9.40
4/28/2015	18:17:48	8.22	-0.07	3.96	9.39
4/28/2015	18:18:48	8.11	-0.05	3.98	9.37
4/28/2015	18:19:48	8.28	-0.02	3.91	9.42
4/28/2015	18:20:48	8.27	-0.05	3.90	9.41
4/28/2015	18:21:48	8.46	-0.06	3.87	9.43
4/28/2015	18:22:48	8.59	-0.05	3.81	9.46
4/28/2015	18:23:48	8.47	-0.08	3.92	9.34
4/28/2015	18:24:48	8.01	-0.02	4.07	9.26
4/28/2015	18:25:48	7.89	-0.10	4.13	9.23
4/28/2015	18:26:48	8.12	-0.09	4.04	9.27
4/28/2015	18:27:48	8.15	-0.12	4.01	9.28
4/28/2015	18:28:48	8.32	-0.11	3.95	9.32
4/28/2015	18:29:48	8.48	-0.08	3.90	9.35
4/28/2015	18:30:48	8.40	-0.13	3.89	9.35
4/28/2015	18:31:48	8.35	-0.23	3.93	9.33
4/28/2015	18:32:48	7.97	-0.24	4.04	9.27
4/28/2015	18:33:48	7.98	-0.24	4.05	9.27
4/28/2015	18:34:48	8.07	-0.19	3.98	9.32
4/28/2015	18:35:48	8.21	-0.23	3.97	9.31
	Average:	8.220	-0.107	3.965	9.343

Field Data Sheet for Flow Rate

Run 1

Client:	Solvay Chemical
Plant:	Green River
Test Location:	Stack
Unit:	Boiler 1 (B0-1)
Project No.:	15016
Meter Operator:	D. Klassen
Assistant:	E. Hagen

Meter ID	3
Meter Y	1.000
Meter ΔH@	1.815
Pitot ID	P-9-1
Pitot Cp	0.84
Probe Liner	S.Steel
Sample Time	60
% CO_2	
% O_2	

Date:	4/29/2015, ~~2014~~
Ambient Temp. °F:	70
Bar. Pressure in. Hg:	23.80
Static Press. in. H_2O +	0 -0.12
Duct Dimensions In.	86 7/8
Port Length In.	
Pitot Passes Leak Checks:	Pretest ☒ Posttest ☒
1st Point all the way	In / Out

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 898.1	853.7	78.0	100	MGS	H_2O
2 811.7	819.4	7.7	100	GS	H_2O
3 659.2	660.4	1.2	0	MGS	empty
4 775.7	906.5	8.4	—	MGS	silica gel
		95.3	*GS = Greenburg Smith *MGS = Modified Greenburg Smith		

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					14:40 0		364.514					Pre-test 1.0 in Hg 0.002 cfm.
RATA Run 1												Post-test 6 in Hg 0002 cfm
8 14:40	0.34	~~0.87~~ 0.34	0.30	118	119	5	~~364.514~~	367.36	65	79	78	1.5	ΔH = 0.85
7	0.37	~~0.87~~	0.32	118	119	10	0.87	370.07	61	79	78	1.5	
6	0.38	~~0.85~~	0.31	118	119	15	0.87	372.79	57	80	79	1.5	
5	0.37	~~0.84~~	0.37	118	119	20	0.85	375.48	52	81	80	1.5	
4		0.35	0.38	119	119	25	0.85	378.26	49	82	81	1.5	
3		0.35	0.35	119	119	30	0.85	381.11	47	83	82	1.5	
2		0.32	0.34	119	119	35	0.85	383.94	47	84	82	1.5	
1		0.28	0.28	119	119	40	0.85	386.75	47	84	82	1.5	
RATA Run 2													
8 1540		0.38	0.33	119	119	45	0.85	389.62	46	84	83	1.5	
7		0.40	0.32	120	119	50	0.85	392.47	45	84	84	1.5	
6		0.42	0.37	119	119	55	0.85	395.32	45	84	84	1.5	
5		0.39	0.42	119	119	60	0.85	398.176	45	84	84	1.5	
4		0.34	0.40	119	119								Optimal Air Testing
3		0.33	0.41	119	119								
2		0.31	0.37	119	119								
1		0.26	0.31	119	118								

SOLVAY2016_1.2_001835

Field Data Sheet for Flow Rate

Run 2

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-1
Project No.:	1501C
Meter Operator:	D. Klein
Assistant:	E Hagen

Meter ID	M3
Meter Y	1.000
Meter ΔH@	1.815
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date:	April 29, 2014
Ambient Temp. °F:	70
Bar. Pressure in. Hg:	23.80
Static Press. in. H_2O +	0.15
Duct Dimensions In.	86 7/8
Port Length In.	
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 853.7	938.6	84.9	100	MGS	H_2O
2 819.4	827.3	7.9	100	GS	H_2O
3 660.4	663.0	2.6	mT	MGS	empty
4 906.5	914.2	7.7	300g	MGS	silica gel
	938.6	103.1			
	827.3				
	663.0				
	914.2				

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

1640 RATA Run 3

1740 RATA RH

Traverse Point	Velocity Head (Δp, in. H_2O) Port 4	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)
					1648 0		398.452				
8	0.35	0.38	120 ~~0.35~~	119	5	0.90	401.41		88	~~88~~	2.0
7/6	0.39/.42	0.40/.42	~~0.39~~ 119/119	120/120	10	0.9	404.41		88	89	2.0
5/4	0.41/.45	0.42/.38	119/119	120/120	15	0.9	407.40		88	88	2.0
3	0.41	0.39	119	119	20	0.9	410.39	51	88	88	2.0
2	0.40	0.34	119	119	25	0.9	413.36	50	88	88	2.0
1	0.29	0.26	119	119	30	0.9	416.30	50	88	89	2.0
8	0.34	0.39	119	119	35	0.9	419.28	49	89	89	2.0
7	0.40	0.41	119	119	40	0.9	422.26	50	90	89	2.0
6	0.41	0.42	119	119	45	0.9	425.68	49	89	89	2.0
5	0.39	0.36	119	119	50	0.9	428.29	49	89	89	2.0
4	0.38	0.38	119	119	55	0.9	431.41	48	90	89	2.0
3	0.37	0.39	119	119	60	0.9	434.501	48	89	89	2.0
2	0.28	0.34	119	118							
1	0.37	0.30	119	118							

Leak Rates/Notes	
Pre-test 0.003 in Hg	10 cfm.
Post-test 5 in Hg	0.003 cfm

Optimal Air Testing

SOLVAY2016_1.2_001836

Field Data Sheet for Flow Rate

Run 3

RATA Runs 5 & 6

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-1
Project No.:	1501C
Meter Operator:	D. Klassen
Assistant:	

Meter ID	3
Meter Y	1.000
Meter ΔH@	1.815
Pitot ID	P-9
Pitot Cp	0.84
Probe Liner	S. Steel
Sample Time	60
% CO_2	
% O_2	

Date:	4/~~28~~30/15 ,~~2014~~
Ambient Temp. °F:	60
Bar. Pressure in. Hg:	23.80
Static Press. in. H_2O +	0 -0.10
Duct Dimensions In.	86 7/8
Port Length In.	
Pitot Passes Leak Checks:	Pretest ☒ Posttest ☒
1st Point all the way	In Out

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 938.6	946.1	7.5	>100	MGS	H_2O
2 827.3	913.3	86.0	>100	GS	H_2O
3 663.0	661.9	-1.1	—	MGS	empty
4 914.2	920.0	5.8	~300g	MGS	silica gel
		98.2			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp. in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH. in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					0910 0		434.652					Pre-test 12 in Hg 0.004 cfm.
8/7	0.35/.36	0.38/.42	119/119	119/119	5	0.90	437.68	64	63	63	2.0	Post-test 6 in Hg 0.002 cfm
6/5	.42/.46	.42/.44	120/120	119/120	10	0.90	440.66	51	63	63	2.0	
4	0.43	0.38	120	120	15	0.90	443.63	44	65	64	2.0	
3	0.44	0.38	120	120	20	0.90	446.60	43	67	64	2.0	
2	0.43	0.36	120	120	25	0.90	449.58	42	67	65	2.0	
1	0.34	0.22	120	119	30	0.90	452.52	41	67	65	2.0	
8	.33	0.38	120	119	35	0.90	455.48	42	66	64	2.0	
7	.40	0.44	120	119	40	0.90	458.43	42	67	64	2.0	
6	.42	0.45	120	119	45	0.90	461.40	42	67	65	2.0	
5	0.43	0.44	120	120	50	0.90	464.39	42	68	65	2.0	
4	0.44	0.38	120	120	55	0.90	467.35	42	67	64	2.0	
3	0.46	0.40	120	120	60	0.90	470.39	42	67	65	2.0	
2	0.43	0.36	120	120								**Optimal Air Testing**
1	0.35	0.28	120	119								

Run 5 RATA 0903

RATA Run 6 10:31

SOLVAY2016_1.2_001837

Field Data Sheet for Flow Rate

Run 4

RATA Runs 7&8

Client:	Solvay Chemical
Plant:	Green River
Test Location:	Stack
Unit:	B0-1
Project No.:	15010
Meter Operator:	D. Klassen
Assistant:	

Meter ID	3
Meter Y	1.000
Meter ΔH@	1.815
Pitot ID	P-9-
Pitot Cp	0.84
Probe Liner	S.Steel
Sample Time	60
% CO_2	
% O_2	

Date:	April 30, 2015, ~~2014~~
Ambient Temp. °F:	65
Bar. Pressure in. Hg:	23.80
Static Press. in. H_2O +	0.08
Duct Dimensions In.	36 7/8
Port Length In.	
Pitot Passes Leak Checks:	
Pretest ☒ Posttest ☒	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 743.6	826.8	83.2	100	MGS	H_2O
2 661.9	817.8	9.6	100	GS	H_2O
3 808.2	663.7	1.8	0	MGS	empty
4 920.0	926.9	6.9	—	MGS	silica gel
		101.5			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					1155 0		471.000					Pre-test 11 in Hg 0.000 cfm.
8/7	.34/.37	.38/.41	120/120	120/121	5	0.91	474.06	57	69	68	2	Post-test 5 in Hg 0.002 cfm
6/5	.40/.39	.43/.43	120/120	121/121	10	0.91	477.05	49	68	68	2	
4	.40	0.38	120	120	15	0.91	480.05	46	68	68	2	
3	.43	0.39	120	120	20	0.91	483.02	48	69	68	2	
2	.40	0.35	120	121	25	0.91	486.07	50	70	69	2	
1	.33	0.27	120	120	30	0.91	489.11	50	70	69	2	
8	0.31	0.33	119	120	35	0.91	492.13	51	70	69	2	
7	0.36	0.41	119	120	40	0.91	495.14	51	71	70	2	
6	0.38	0.42	119	120	45	0.91	498.12	52	71	70	2	
5	0.37	0.42	119	120	50	0.91	501.09	53	70	70	2	
4	0.41	0.37	120	120	55	0.91	504.07	53	70	70	2	
3	0.41	0.36	120	120	1255 60	0.91	507.02	54	71	71	2	
2	0.39	0.36	119	120								**Optimal Air Testing**
1	0.34	0.26	119	120								

RATA Run 7 1140
RATA Run 8 1251

SOLVAY2016_1.2_001838

Field Data Sheet for Flow Rate

Run 5

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-4 1 & 2
Project No.:	15010
Meter Operator:	D. Klassen
Assistant:	

Meter ID	3
Meter Y	1.000
Meter ΔH@	1.815
Pitot ID	P-9-
Pitot Cp	0.84
Probe Liner	S.Steel
Sample Time	6
% CO_2	
% O_2	

Date:	4/30/15 , 2014
Ambient Temp. °F:	65
Bar. Pressure in. Hg:	23.80
Static Press. in. H_2O +/-	0.09
Duct Dimensions In.	86 7/8
Port Length In.	
Pitot Passes Leak Checks:	Pretest ☒ Posttest ☒
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 426.8	899.3	72.5	7100	MGS	H_2O
2 817.8	828.8	11.0	> 100	GS	H_2O
3 663.7	664.4	0.7	—	MGS	empty
4 926.4	931.6	4.7	~300g	MGS	silica gel
		88.9			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					1350 0		507.301					Pre-test 6 in Hg 0.000 cfm.
8/7	0.30	0.32	120	120	1355 5	1.8	511.24	54	71	70	2.0	Post-test 6 in Hg 0.002 cfm
6/5	0.36	.37	120	120	10	1.8	515.10	44	71	71	2.0	
6	0.37	.38	120	120	15	1.8	519.02	42	72	72	2.0	
5	0.39	0.37	120	120	20	1.8	523.00	42	72	72	2.0	
4	0.37	0.34	120	120	25	1.8	526.96	42	72	72	2.0	
3	0.38	0.34	120	120	30	1.8	530.92	43	72	72	2.0	
2	0.34	0.31	120	119	35	1.8	534.84	44	72	72	2.0	
1	0.33	0.25	120	119	1430 40	1.8	538.81	45	72	72	2.0	
												Optimal Air Testing

SOLVAY2016_1.2_001839

Field Data Sheet for Flow Rate

Run 1

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-2
Project No.:	1501C
Meter Operator:	E. Hagen
Assistant:	D. Klusza

Meter ID	M4
Meter Y	1.0160
Meter ΔH@	1.7127
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	S
Sample Time	60
% CO_2	
% O_2	

Date:	May 4, 2015
Ambient Temp. °F:	64°F
Bar. Pressure in. Hg:	23.74
Static Press. in. H_2O	(+) - 0.11
Duct Dimensions In.	86 1/8"
Port Length In.	8 7/8"
Pitot Passes Leak Checks:	Pretest ☑ Posttest ☑
1st Point all the way	(In) Out

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 766.1	831.1	65.0	100	MGS	H_2O
2 800.8	811.6	10.8	100	GS	H_2O
3 664.6	667.1	2.5	MT	MGS	empty
4 930.0	937.8	7.8	300g	MGS	silica gel
		86.1			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

40' upstream from restriction

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes 10:15	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3) 401.327	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
												Pre-test 10 in Hg 0.004 cfm.
												Post-test 5 in Hg 0.002 cfm
10:00 6	0.34	0.30	114	114	5	0.90	404.35	53	61	60	<1	
5	0.42	0.41	114	114	10	0.90	407.28	50	61	61	<1	
4	0.63	0.47	115	114	15	0.90	410.23	44	62	61	<1	
3	0.46	0.48	115	114	20	0.90	413.19	42	62	62	<1	
2	0.40	0.41	115	114	25	0.90	416.14	41	63	62	<1	
1	0.35	0.35	114	114	30	0.90	419.10	42	65	63	1	
10:43 6	0.35	0.34	114	114	35	0.90	422.08	44	66	64	1	
5	0.48	0.45	114	115	40	0.90	425.12	44	67	63	1	
4	0.49	0.47	114	115	45	0.90	428.15	45	68	65	1	
3	0.50	0.49	114	114	50	0.90	431.15	46	68	65	1	
2	0.45	0.44	114	114	55	0.90	434.24	47	68	66	1	
1	0.39	0.37	114	114	60	0.90	437.334	47	70	66	1	
												Optimal Air Testing

Field Data Sheet for Flow Rate

Run 2

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-2
Project No.:	1501C
Meter Operator:	E. Hogen
Assistant:	D Klussen

Meter ID	M4
Meter Y	1.0160
Meter ΔH@	1.7127
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date:	May 4th, 2016
Ambient Temp. °F:	60°F
Bar. Pressure in. Hg:	23.74
Static Press. in. H_2O ⊕ -	0.12
Duct Dimensions In.	86 1/16"
Port Length In.	8 7/8"
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 831.1	912.3	81.2	100	MGS	H_2O
2 811.6	822.4	10.8	100	GS	H_2O
3 667.1	669.1	2.0	MT	MGS	empty
4 937.8	944.1	6.3	300g	MGS	silica gel
		100.3			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					11:50		437.397					Pre-test 5 in Hg 0.004 cfm.
11:40 6	0.36	0.37	115	115	5	0.90	441.31	46	70	70	1	Post-test 5 in Hg 0.002 cfm
5	0.45	0.40	115	115	10	0.90	444.28	38	71	70	1	
4	0.51	0.52	115	115	15	0.90	447.34	38	71	70	1	
3	0.52	0.50	116	115	20	0.90	450.35	39	71	71	1	
2	0.47	0.46	116	115	25	0.90	453.35	39	72	71	1	
1	0.38	0.37	116	116	30	0.90	456.46	40	72	71	1	
12:31 6	0.37	0.37	115	115	35	0.90	459.46	40	73	71	1	
5	0.46	0.48	115	115	40	0.90	462.47	41	73	72	1	
4	0.52	0.53	115	115	45	0.90	465.43	42	72	71	1	
3	0.52	0.54	115	115	50	0.90	468.36	42	73	72	1	
2	0.48	0.50	115	115	55	0.90	471.28	43	74	72	1	
1	0.39	0.36	115	115	60	0.90	474.189	43	74	72	1	
												Optimal Air Testing

SOLVAY2016_1.2_001841

Field Data Sheet for Flow Rate

Run 3

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-2
Project No.:	1501C
Meter Operator:	E. Hegen
Assistant:	D. Klassen

Meter ID	M4
Meter Y	1.0160
Meter ΔH@	1.7127
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date:	May the 4th, 2014
Ambient Temp. °F:	60°F
Bar. Pressure in. Hg:	23.74
Static Press. in. H_2O	0.05
Duct Dimensions In.	86 1/8"
Port Length In.	8 7/8"
Pitot Passes Leak Checks:	Pretest ☑ Posttest ☑
1st Point all the way In Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
[1] 912.3	950.1	37.8	100	MGS	H_2O
[2] 822.4	868.4	46.0	100	GS	H_2O
[3] 669.1	670.8	1.7	MT	MGS	empty
[4] 944.1	950.5	6.4	300g	MGS	silica gel
		91.9			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					13:34		474.250					Pre-test 7 in Hg 0.004 cfm.
13:26 6	0.36	0.34	115	116	5	0.90	477.25	44	72	72	1	Post-test 7 in Hg 0.004 cfm
5	0.47	0.42	116	116	10	0.90	480.24	42	72	72	1	
4	0.50	0.50	115	116	15	0.90	483.23	40	72	72	1	
3	0.51	0.51	115	116	20	0.90	486.23	40	72	72	1	
2	0.46	0.48	115	116	25	0.90	489.21	41	73	73	1	
1	0.36	0.35	115	115	30	0.90	492.25	42	73	73	1.5	
14:18 6	0.35	0.34	116	115	35	0.90	495.29	42	73	73	1.5	
5	0.46	0.45	116	115	40	0.90	498.31	43	74	72	1.5	
4	0.50	0.48	116	116	45	0.90	501.34	43	74	73	1.5	
3	0.51	0.46	116	116	50	0.90	504.35	44	75	73	1.5	
2	0.47	0.42	116	116	55	0.90	507.34	44	75	73	1.5	
1	0.35	0.33	115	116	60	0.90	510.36	44	76	74	1.5	
												Optimal Air Testing

Field Data Sheet for Flow Rate

Run 4

Client:	Solvay Chemicals
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-2
Project No.:	1501C
Meter Operator:	E Hazen
Assistant:	D. Klassen

Meter ID	M4
Meter Y	1.0160
Meter ΔH@	1.7127
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date:	May 4 2015, ~~2016~~
Ambient Temp. °F:	64°F
Bar. Pressure in. Hg:	23.74
Static Press. in. H_2O ⊕ ⊖	- 0.10
Duct Dimensions In.	86 1/8"
Port Length In.	8 1/8"
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 779.9	893.6	113.7	100	MGS	H_2O
2 868.4	841.4	-27.0	100	GS	H_2O
3 670.8	671.4	0.6	MT	MGS	empty
4 950.5	956.3	5.8	300g	MGS	silica gel
		93.1			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)
15:07 6	0.38	0.39	115	116	15:12 5	0.90	510.457 513.46	51	75	75	<1
5	0.48	0.48	115	115	10	0.90	516.43	42	75	75	<1
4	0.51	0.52	115	116	15	0.90	519.45	42	75	75	<1
3	0.50	0.49	115	116	20	0.90	522.44	42	75	75	<1
2	0.45	0.44	115	116	25	0.90	525.42	43	76	75	<1
1	0.36	0.34	115	115	30	0.90	528.40	44	77	75	<1
15:50 6	0.35	0.35	115	115	35	0.90	531.39	44	77	76	1
5	0.47	0.47	115	115	40	0.90	534.39	45	78	76	1
4	0.53	0.48	115	115	45	0.90	537.39	45	78	77	1
3	0.53	0.50	115	115	50	0.90	540.37	45	79	77	1
2	0.47	0.47	115	115	55	0.90	543.36	45	79	78	1
1	0.36	0.38	115	115	60	0.90	546.358	46	79	78	1.5

Leak Rates/Notes

Pre-test 7 in Hg 0.004 cfm.

Post-test 7 in Hg 0.002cfm

Optimal Air Testing

Field Data Sheet for Flow Rate

Run 5

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-2
Project No.:	1501C
Meter Operator:	E. Hazen
Assistant:	D. Klassen

Meter ID	M4
Meter Y	1.0160
Meter ΔH@	1.7127
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	40
% CO_2	
% O_2	

Date:	May 4, 2015
Ambient Temp. °F:	55°F
Bar. Pressure in. Hg:	23.74
Static Press. in. H_2O	Ⓐ - 0.14
Duct Dimensions In.	86 1/8"
Port Length In.	8 7/8"
Pitot Passes Leak Checks:	Pretest ☑ Posttest ☑
1st Point all the way	(In) Out

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 893.6	894.0	0.4	100	MGS	H_2O
2 841.4	917.7	76.3	100	GS	H_2O
3 671.4	672.6	1.2	MT	MGS	empty
4 956.3	962.0	5.7	300g	MGS	silica gel
		83.6			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

B

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					16:19		546.480					Pre-test 9 in Hg 0.004 cfm.
1) 0.36 16:37	6 0.34	0.45	115	115	5	1.7	550.52	43	77	77	1.0	Post-test 7 in Hg 0.003 cfm
	5 0.44	0.46	115	116	10	1.7	554.49	41	77	77	1.0	
	4 0.51	0.46	115	116	15	1.7	558.55	41	77	77	1.5	
	3 0.52	0.50	115	116	20	1.7	562.60	42	77	77	1.5	
	2 0.48	0.46	115	115	25	1.7	566.66	42	78	77	1.5	
	1 0.38	0.36	115	116	30	1.7	570.71	43	79	77	1.5	
					35	1.7	574.88	44	79	77	1.5	
					40	1.7	578.860	44	79	77	1.5	
												Optimal Air Testing

SOLVAY2016_1.2_001844

Field Data Sheet for Flow Rate

Run 1

Client: **Wyoming Refining Co.**	
Plant: Newcastle, WY	
Test Location: Stack	
Unit: BO-4	
Project No.: ~~1403~~ 1501C	
Meter Operator: E. Hagen	
Assistant: D. Klassen	

Meter ID M2	
Meter Y 1.000	
Meter ΔH@ 1.643	
Pitot ID V-9-1	
Pitot Cp 0.84	
Probe Liner SS	
Sample Time 60	
% CO_2	
% O_2	

Date: ~~February~~ 28, 2014	
Ambient Temp. °F:	60's
Bar. Pressure in. Hg	23.85
Static Press. in. H_2O	-0.09
Duct Dimensions In.	71 15/16
Port Length In.	6 13/16
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 846.8	886.7	39.9	~100	MGS	H_2O
2 771.2	836.2	65.0	~100	GS	H_2O
3 665.2	665.5	0.3	MT	MGS	empty
4 901.3	906.5	5.2	~300	MGS	silica gel
		110.4	*GS = Greenburg Smith *MGS = Modified Greenburg Smith		

	Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
						13:26		597.487					Pre-test 10 in Hg .004 cfm.
													Post-test 7 in Hg 0.002 cfm
13:13	6	0.39	0.35	324	330	5	0.85	600.47	64	79	79	<1	Port A 78¾ - 6¾ = 72"
	5	0.40	0.37	325	328	10	0.85	603.45	63	79	79	<1	Port B 78⅜ - 6⅝ = 71⅞
	4	0.42	0.39	329	329	15	0.85	606.43	62	80	80	<1	M2 10
0.50	3	0.42	~~0.46~~	330	329	20	0.85	609.40	63	82	81	<1	17¼
	2	0.40	0.46	328	331	25	0.85	612.38	63	83	82	<1	28.0
	1	0.27	0.37	327	328	30	0.85	615.35	62	84	83	<1	57⅜
1405	6	0.33	0.38	328	329	35	0.85	618.31	62	85	84	<1	68⅛
	5	0.35	0.42	331	332	40	0.85	621.27	58	85	84	<1	75 7/16
	4	0.41	0.44	333	333	45	0.85	624.22	57	~~85~~ 86	84	<1	
	3	0.48	0.42	336	332	50	0.85	627.18	56	87	85	<1	
	2	0.46	0.40	332	330	55	0.85	630.16	55	87	86	<1	
1415	1	0.39	0.31	327	322	1426 60	0.85	633.15	54	87	85	<1	
													Optimal Air Testing

SOLVAY2016_1.2_001845

Field Data Sheet for Flow Rate

Run 2

Client: ~~Wyoming Refining Co.~~	
Plant: ~~Newcastle~~, ~~WY~~	
Test Location: Stack	
Unit: Boiler 4	
Project No.: ~~1403~~ 1501C	
Meter Operator: D. Klassen	
Assistant: E. Hagen	

Meter ID	MZ
Meter Y	1.000
Meter ΔH@	1.643
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date: ~~February~~ 28, ~~2014~~	
Ambient Temp. °F:	60's
Bar. Pressure in. Hg	30.25 − 6.4 = 23.85
Static Press. in. H_2O	+0 0.10
Duct Dimensions In.	71 15/16
Port Length In.	6 3/16
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 886.7	845.7	45.5	100 mL	MGS	H_2O
2 836.2	982.2	9.5	100 mL	GS	H_2O
3 665.5	667.9	2.4	MT	MGS	empty
4 906.5	912.9	6.4	800 g	MGS	silica gel
		113.8			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					1446 0		633.683					Pre-test 7 in Hg 0.002 cfm.
1455 6	0.32	0.36	324	325	5	0.85	636.69	66	89	89	<1	Post-test 5 in Hg 0.002 cfm
5	0.35	0.40	327	329	10	0.85	639.70	58	89	89	<1	
4	0.40	0.42	329	331	15	0.85	642.71	55	89	89	1	
3	0.50	0.43	331	330	20	0.85	645.70	54	89	89	1	
2	0.45	0.35	330	326	25	0.85	648.62	53	89	89	1	
1	0.36	0.30	324	320	30	0.85	651.64	51	90	89	1	
					35	0.85	654.60	49	91	89	1	
1539 6	0.32	0.34	324	324	40	0.85	657.69	50	90	89	1	
5	0.36	0.39	324	327	45	0.85	660.77	50	92	90	1	
4	0.39	0.44	327	329	50	0.85	663.69	50	93	91	1	
3	0.48	0.46	330	331	55	0.85	666.68	50	94	91	1	
2	0.46	0.49	331	331	60	0.85	669.690	50	94	91	1	
1	0.39	0.25	331	328								Optimal Air Testing

SOLVAY2016_1.2_001846

Field Data Sheet for Flow Rate

Run 3

Client: ~~Wyoming Refining Co.~~	
Plant: ~~Newcastle, WY~~	
Test Location: Stack	
Unit: BO.4	
Project No.: ~~1485~~ 1501C	
Meter Operator: E. Hagen	
Assistant: D. Klassen	

Meter ID	M2
Meter Y	1.000
Meter ΔH@	1.643
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

April

Date: ~~February~~ 28 , 2014	
Ambient Temp. °F:	60's
Bar. Pressure in. Hg	23.85
Static Press. in. H_2O	-0.10
Duct Dimensions In	71 15/16
Port Length In.	6 13/16
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way In Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 775.6	872.2	46.6	100	MGS	H_2O
2 783.9	792.5	8.6	100	GS	H_2O
3 667.9	667.9	0.0	MT	MGS	empty
4 912.9	919.6	6.7	300g	MGS	silica gel
		111.9			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					16:33		669.800					Pre-test 9 in Hg 0.003 cfm.
16:25 6	0.30	0.36	328	329	5	0.85	672.85	54	95	92	<1	Post-test 5 in Hg 0.001 cfm
5	0.41	0.40	328	330	10	0.85	675.85	52	92	92	<1	
4	0.39	0.44	331	334	15	0.85	678.85	54	92	92	<1	
3	0.51	0.50	333	332	20	0.85	681.84	55	93	92	<1	
2	0.48	0.53	333	329	25	0.85	684.84	55	93	92	<1	
1	0.33	0.27	324	312	30	0.85	687.84	56	94	92	<1	
					35	0.85	690.83	53	94	92	<1	
17:11 6	0.32	0.40	328	327	40	0.85	693.83	54	95	93	<1	
5	0.40	0.45	329	331	45	0.85	696.83	56	95	93	<1	
4	0.40	0.42	332	334	50	0.85	699.83	56	95	943	<1	
3	0.54	0.52	335	332	55	0.85	702.87	57	95	94	<1	
2	0.49	0.46	332	330	60	0.85	705.87	57	96	94	<1	
1	0.34	0.31	328	325								Optimal Air Testing

Run 4

Field Data Sheet for Flow Rate

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-4
Project No.:	1501C
Meter Operator:	E. Hagen
Assistant:	D. Klassen

Meter ID	MZ
Meter Y	1.000
Meter ΔH@	1.643
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	60
% CO_2	
% O_2	

Date:	April 28 2015
Ambient Temp. °F:	60's
Bar. Pressure in. Hg:	23.85
Static Press. in. H_2O +⊖	0.10
Duct Dimensions In.	71 15/16
Port Length In.	6 13/16
Pitot Passes Leak Checks: Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

1 757.1
2 800.3
3 668.8
4 926.9

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 766.2	864.4	98.2	100	MGS	H_2O
2 792.5	800.3	7.8	100	GS	H_2O
3 667.9	668.5	0.6	MT	MGS	empty
4 919.6	925.9	6.3	300g	MGS	silica gel
		112.9			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)
					18:08		706.117				
17:58 6	0.37	0.36	321	327	5	0.85	709.13	57	90	89	<1
5	0.47	0.41	328	332	10	0.85	712.14	52	89	89	<1
4	0.48	0.44	331	333	15	0.85	715.16	53	89	89	<1
3	0.41	0.46	333	333	20	0.85	718.13	57	90	89	<1
2	0.36	0.450	331	328	25	0.85	721.12	53	91	90	<1
1	0.30	0.26	326	322	30	0.85	724.01	53	93	91	<1
					35	0.85	727.17	54	92	91	<1
18:41 6	0.30	0.37	324	326	40	0.85	730.16	55	93	91	<1
5	0.36	0.40	328	329	45	0.85	733.18	55	92	91	<1
4	0.41	0.43	331	331	50	0.85	736.26	56	93	91	<1
3	0.51	0.44	333	330	55	0.85	739.28	57	93	92	<1
2	0.49	0.41	332	324	60	0.85	742.255	57	93	91	<1
1	0.39	0.30	324	321							

Leak Rates/Notes
Pre-test 8 in Hg 0.002 cfm.
Post-test 5 in Hg 0.001 cfm

Optimal Air Testing

SOLVAY2016_1.2_001848

Field Data Sheet for Flow Rate

Run 5

Client:	Solvay Chemical
Plant:	Green River, WY
Test Location:	Stack
Unit:	BO-4
Project No.:	1501C
Meter Operator:	E. Hagen
Assistant:	D. Klassen

Meter ID	MZ
Meter Y	1.000
Meter ΔH@	1.643
Pitot ID	V-9-1
Pitot Cp	0.84
Probe Liner	SS
Sample Time	
% CO_2	
% O_2	

Date:	April 28, 2014
Ambient Temp. °F:	58
Bar. Pressure in. Hg:	23.85
Static Press. in. H_2O +	0.10
Duct Dimensions In.	71 15/16
Port Length In.	6 13/16
Pitot Passes Leak Checks:	
Pretest ☑ Posttest ☑	
1st Point all the way (In) Out	

Impinger Weight			Impinger		
Pretest (g)	Post test (g)	Total (g)	Vol. (ml)	Style*	Contents
1 757.1	837.6	80.5	100	MGS	H_2O
2 800.3	812.3	12.0	100	GS	H_2O
3 668.8	670.4	1.6	MT	MGS	empty
4 925.9	931.8	5.9	300g	MGS	silica gel
		100.0			

*GS = Greenburg Smith
*MGS = Modified Greenburg Smith

Traverse Point	Velocity Head (Δp, in. H_2O) Port A	Port B	Gas Temp. Degrees F Port A	Port B	Time minutes	Orifice Setting (ΔH, in. H_2O)	Gas Meter Vol. (ft^3)	Temperature, °F Impinger Outlet	Gas Meter Inlet	Gas Meter Outlet	Pump Vacuum (in. Hg)	Leak Rates/Notes
					19:20		742.493					Pre-test 9 in Hg 0.003 cfm.
1925 6	0.33	0.37	324	324	5	1.8	746.91	57	89	88	<1	Post-test 5 in Hg 0.001 cfm
5	0.38	0.40	325	326	10	1.8	751.37	51	88	87	<1	
4	0.40	0.43	330	332	15	1.8	755.81	51	88	87	<1	
3	0.50	0.45	333	333	20	1.8	760.23	51	87	87	1	
2	0.49	0.44	334	332	25	1.8	764.68	51	87	87	1	
1	0.40	0.35	329	330	30	1.8	769.01	51	87	87	1	769.01
					35	1.8	773.380	60	87	87	1	

Optimal Air Testing

Optimal
AIR TESTING SERVICES, INC

APPENDIX C

Solvay Boiler CEM Data

RI

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 1:13 PM thru 4/29/2015 1:33 PM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/29 13:13	295.59	0.5156	127.47	0.40	0.0010	0.25	6.94	68.79
4/29 13:14	298.40	0.5187	127.64	0.43	0.0010	0.25	6.89	68.47
4/29 13:15	298.12	0.5178	127.23	0.30	0.0007	0.17	6.88	68.21
4/29 13:16	297.23	0.5200	127.44	0.32	0.0008	0.20	6.98	68.30
4/29 13:17	298.02	0.5169	127.13	0.32	0.0008	0.20	6.86	68.38
4/29 13:18	296.77	0.5133	126.60	0.32	0.0008	0.20	6.82	68.30
4/29 13:19	297.44	0.5115	127.32	0.22	0.0005	0.12	6.74	68.50
4/29 13:20	297.54	0.5143	129.31	0.31	0.0007	0.18	6.81	69.19
4/29 13:21	298.64	0.5173	130.29	0.29	0.0007	0.18	6.84	69.64
4/29 13:22	296.26	0.5139	129.14	0.29	0.0007	0.18	6.86	69.54
4/29 13:23	296.05	0.5131	128.24	0.27	0.0007	0.17	6.85	69.27
4/29 13:24	298.03	0.5199	129.39	0.33	0.0008	0.20	6.94	69.03
4/29 13:25	295.02	0.5191	127.69	0.32	0.0008	0.20	7.06	68.94
4/29 13:26	293.53	0.5161	126.52	0.31	0.0008	0.20	7.05	68.76
4/29 13:27	295.45	0.5158	126.37	0.31	0.0008	0.20	6.95	68.66
4/29 13:28	294.76	0.5172	126.75	0.35	0.0009	0.22	7.02	68.68
4/29 13:29	297.00	0.5196	127.15	0.27	0.0007	0.17	6.98	68.58
4/29 13:30	296.13	0.5147	126.34	0.28	0.0007	0.17	6.89	68.41
4/29 13:31	296.92	0.5183	127.21	0.29	0.0007	0.17	6.95	68.40
4/29 13:32	296.70	0.5168	126.99	0.29	0.0007	0.17	6.92	68.48
4/29 13:33	297.46	0.5171	127.01	0.31	0.0007	0.17	6.89	68.40
Average (all)	296.72	0.5165	127.58	0.31	0.0008	0.19	6.91	68.71
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	293.53	0.5115	126.34	0.22	0.0005	0.12	6.74	68.21
Maximum (all)	298.64	0.5200	130.29	0.43	0.0010	0.25	7.06	69.64
Average (valid values only)	296.72	0.5165	127.58	0.31	0.0008	0.19	6.91	68.71
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

R1

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 1:13 PM thru 4/29/2015 1:33 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 13:13	12.61
4/29 13:14	12.61
4/29 13:15	12.64
4/29 13:16	12.59
4/29 13:17	12.62
4/29 13:18	12.67
4/29 13:19	12.75
4/29 13:20	12.75
4/29 13:21	12.69
4/29 13:22	12.68
4/29 13:23	12.66
4/29 13:24	12.65
4/29 13:25	12.52
4/29 13:26	12.51
4/29 13:27	12.52
4/29 13:28	12.52
4/29 13:29	12.52
4/29 13:30	12.59
4/29 13:31	12.59
4/29 13:32	12.59
4/29 13:33	12.60
Average (all)	12.61
Total (all)	--
Minimum (all)	12.51
Maximum (all)	12.75
Average (valid values only)	12.61
Total (valid values only)	--
Count (valid values only)	21

R2

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 2:15 PM thru 4/29/2015 2:35 PM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/29 14:15	272.62	0.4698	114.69	0.32	0.0008	0.20	6.77	66.97
4/29 14:16	289.28	0.4525	122.34	0.39	0.0008	0.22	5.33	68.05
4/29 14:17	299.16	0.4926	128.98	0.38	0.0009	0.24	6.11	68.82
4/29 14:18	299.63	0.5186	129.88	0.33	0.0008	0.20	6.83	69.14
4/29 14:19	297.49	0.5216	130.87	0.19	0.0005	0.13	7.01	70.26
4/29 14:20	298.16	0.5161	131.76	0.21	0.0005	0.13	6.83	70.98
4/29 14:21	295.61	0.5135	130.52	0.31	0.0007	0.18	6.88	70.67
4/29 14:22	297.90	0.5055	129.50	0.29	0.0007	0.18	6.55	69.90
4/29 14:23	297.39	0.5002	128.70	0.29	0.0007	0.18	6.42	69.50
4/29 14:24	297.57	0.5025	129.11	0.28	0.0007	0.18	6.48	69.40
4/29 14:25	297.31	0.5007	128.89	0.29	0.0007	0.18	6.44	69.53
4/29 14:26	296.98	0.5043	129.99	0.25	0.0006	0.15	6.56	69.84
4/29 14:27	297.50	0.5017	129.57	0.24	0.0006	0.15	6.46	69.92
4/29 14:28	297.82	0.4951	129.28	0.23	0.0005	0.13	6.25	69.78
4/29 14:29	296.55	0.4998	129.11	0.26	0.0006	0.15	6.45	69.94
4/29 14:30	294.61	0.5085	129.96	0.18	0.0004	0.10	6.79	70.50
4/29 14:31	292.07	0.5165	128.40	0.22	0.0005	0.12	7.13	70.57
4/29 14:32	277.45	0.5095	120.96	0.19	0.0005	0.12	7.64	69.65
4/29 14:33	268.56	0.4823	113.92	0.22	0.0005	0.12	7.34	68.27
4/29 14:34	267.11	0.4633	112.55	0.24	0.0006	0.15	6.86	67.49
4/29 14:35	276.82 <25>	0.4506 <25>	115.75 <25>	0.26 <25>	0.0006 <25>	0.15 <25>	5.94 <25>	67.16
Average (all)	290.84	0.4964	125.94	0.27	0.0006	0.16	6.62	69.35
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	267.11	0.4506	112.55	0.18	0.0004	0.10	5.33	66.97
Maximum (all)	299.63	0.5216	131.76	0.39	0.0009	0.24	7.64	70.98
Average (valid values only)	291.54	0.4987	126.45	0.27	0.0006	0.16	6.66	69.35
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	20	20	20	20	20	20	20	21

<25> = Backflush

R2

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 2:15 PM thru 4/29/2015 2:35 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 14:15	12.79
4/29 14:16	13.94
4/29 14:17	13.35
4/29 14:18	12.71
4/29 14:19	12.53
4/29 14:20	12.62
4/29 14:21	12.62
4/29 14:22	12.86
4/29 14:23	12.99
4/29 14:24	12.99
4/29 14:25	12.99
4/29 14:26	12.95
4/29 14:27	12.96
4/29 14:28	13.13
4/29 14:29	12.96
4/29 14:30	12.72
4/29 14:31	12.36
4/29 14:32	11.96
4/29 14:33	12.14
4/29 14:34	12.63
4/29 14:35	13.42 <25>
Average (all)	12.84
Total (all)	–
Minimum (all)	11.96
Maximum (all)	13.94
Average (valid values only)	12.81
Total (valid values only)	–
Count (valid values only)	20

<25> = Backflush

R3

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 3:16 PM thru 4/29/2015 3:36 PM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/29 15:16	293.80	0.4958	127.42	0.22	0.0005	0.13	6.47	69.63
4/29 15:17	295.80	0.4978	128.39	0.24	0.0006	0.15	6.43	69.88
4/29 15:18	297.70	0.5021	130.39	0.19	0.0004	0.10	6.46	70.36
4/29 15:19	295.89	0.5053	130.81	0.10	0.0002	0.05	6.64	70.74
4/29 15:20	297.36	0.5001	130.84	0.17	0.0004	0.10	6.42	70.78
4/29 15:21	295.92	0.4994	131.15	0.14	0.0003	0.08	6.47	70.77
4/29 15:22	294.73	0.4988	130.29	0.17	0.0004	0.10	6.51	70.88
4/29 15:23	294.76	0.4900	130.07	0.15	0.0003	0.08	6.25	70.99
4/29 15:24	295.69	0.4956	131.40	0.21	0.0005	0.13	6.37	71.07
4/29 15:25	294.29	0.4956	131.21	0.17	0.0004	0.11	6.44	71.29
4/29 15:26	296.10	0.4997	132.69	0.20	0.0005	0.13	6.47	71.67
4/29 15:27	296.62	0.4961	132.66	0.20	0.0005	0.13	6.34	71.73
4/29 15:28	295.71	0.4936	132.18	0.19	0.0004	0.11	6.31	71.67
4/29 15:29	293.29	0.4922	131.83	0.21	0.0005	0.13	6.39	71.96
4/29 15:30	295.44	0.4965	132.84	0.18	0.0004	0.11	6.41	72.05
4/29 15:31	294.36	0.4910	131.30	0.21	0.0005	0.13	6.30	71.68
4/29 15:32	295.28	0.4959	131.63	0.18	0.0004	0.11	6.40	71.37
4/29 15:33	296.14	0.4960	130.88	0.18	0.0004	0.11	6.36	70.95
4/29 15:34	296.23	0.4989	130.65	0.16	0.0004	0.10	6.44	70.68
4/29 15:35	295.41	0.4968	130.35	0.12	0.0003	0.08	6.42	70.71
4/29 15:36	293.58	0.4917	129.51	0.18	0.0004	0.11	6.36	70.82
Average (all)	295.43	0.4966	130.88	0.18	0.0004	0.11	6.41	71.03
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	293.29	0.4900	127.42	0.10	0.0002	0.05	6.25	69.63
Maximum (all)	297.70	0.5053	132.84	0.24	0.0006	0.15	6.64	72.05
Average (valid values only)	295.43	0.4966	130.88	0.18	0.0004	0.11	6.41	71.03
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

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R3

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 3:16 PM thru 4/29/2015 3:36 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 15:16	12.95
4/29 15:17	12.95
4/29 15:18	12.95
4/29 15:19	12.84
4/29 15:20	12.97
4/29 15:21	13.02
4/29 15:22	12.93
4/29 15:23	13.12
4/29 15:24	13.09
4/29 15:25	13.03
4/29 15:26	13.00
4/29 15:27	13.08
4/29 15:28	13.11
4/29 15:29	13.06
4/29 15:30	13.03
4/29 15:31	13.09
4/29 15:32	13.05
4/29 15:33	13.05
4/29 15:34	13.00
4/29 15:35	13.02
4/29 15:36	13.05
Average (all)	13.02
Total (all)	--
Minimum (all)	12.84
Maximum (all)	13.12
Average (valid values only)	13.02
Total (valid values only)	--
Count (valid values only)	21

R4

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 4:21 PM thru 4/29/2015 4:41 PM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) CO2% 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/29 16:21	289.63	0.5013	131.98	0.17	0.0004	0.11	12.67	6.83	72.91
4/29 16:22	287.72	0.5001	131.78	0.13	0.0003	0.08	12.61	6.89	73.32
4/29 16:23	294.42	0.5028	133.53	0.09	0.0002	0.05	12.76	6.64	73.03
4/29 16:24	290.28	0.4961	131.44	0.14	0.0003	0.08	12.81	6.65	72.57
4/29 16:25	287.55	0.5013	130.96	0.19	0.0005	0.13	12.59	6.93	72.81
4/29 16:26	285.34	0.5010	129.82	0.11	0.0003	0.08	12.46	7.03	72.97
4/29 16:27	288.80	0.5067	131.14	0.06	0.0001	0.03	12.49	7.02	72.71
4/29 16:28	283.15	0.5018	128.56	0.08	0.0002	0.05	12.38	7.16	72.61
4/29 16:29	284.11	0.5058	129.57	0.00	0.0000	0.00	12.35	7.22	72.78
4/29 16:30	291.77	0.5004	131.43	0.04	0.0001	0.03	12.72	6.70	72.45
4/29 16:31	295.53	0.5065	131.96	0.07	0.0002	0.05	12.80	6.69	71.42
4/29 16:32	294.69	0.4973	129.05	0.11	0.0003	0.08	12.93	6.47	70.42
4/29 16:33	297.43	0.5033	129.78	0.13	0.0003	0.08	12.94	6.51	69.92
4/29 16:34	295.41	0.5013	128.71	0.10	0.0002	0.05	12.94	6.55	69.62
4/29 16:35	295.88	0.5018	128.00	0.14	0.0003	0.08	12.91	6.54	69.33
4/29 16:36	294.79	0.5027	127.07	0.18	0.0004	0.10	12.85	6.62	69.02
4/29 16:37	295.15	0.5055	127.51	0.17	0.0004	0.10	12.82	6.68	69.04
4/29 16:38	294.11	0.4995	126.54	0.07	0.0002	0.05	12.84	6.56	69.23
4/29 16:39	294.66	0.4935	126.77	0.01	0.0000	0.00	12.98	6.36	69.44
4/29 16:40	296.10	0.4987	128.71	0.02	0.0000	0.00	12.98	6.44	69.77
4/29 16:41	294.59	0.5059	128.51	0.13	0.0003	0.08	12.74	6.72	69.96
Average (all)	291.96	0.5016	129.66	0.10	0.0002	0.06	12.74	6.72	71.21
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	283.15	0.4935	126.54	0.00	0.0000	0.00	12.35	6.36	69.02
Maximum (all)	297.43	0.5067	133.53	0.19	0.0005	0.13	12.98	7.22	73.32
Average (valid values only)	291.96	0.5016	129.66	0.10	0.0002	0.06	12.74	6.72	71.21
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

R4

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 4:21 PM thru 4/29/2015 4:41 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 16:21	12.67
4/29 16:22	12.61
4/29 16:23	12.76
4/29 16:24	12.81
4/29 16:25	12.59
4/29 16:26	12.46
4/29 16:27	12.49
4/29 16:28	12.38
4/29 16:29	12.35
4/29 16:30	12.72
4/29 16:31	12.80
4/29 16:32	12.93
4/29 16:33	12.94
4/29 16:34	12.94
4/29 16:35	12.91
4/29 16:36	12.85
4/29 16:37	12.82
4/29 16:38	12.84
4/29 16:39	12.98
4/29 16:40	12.98
4/29 16:41	12.74
Average (all)	12.74
Total (all)	--
Minimum (all)	12.35
Maximum (all)	12.98
Average (valid values only)	12.74
Total (valid values only)	--
Count (valid values only)	21

R5

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 7:44 AM thru 4/30/2015 8:04 AM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/30 7:44	300.97	0.5122	136.03	0.97	0.0023	0.61	6.59	72.01
4/30 7:45	299.95	0.5090	135.26	0.88	0.0021	0.56	6.55	72.00
4/30 7:46	298.83	0.5075	134.69	0.82	0.0019	0.50	6.56	71.85
4/30 7:47	299.77	0.5119	135.28	0.77	0.0018	0.48	6.64	71.55
4/30 7:48	301.90	0.5141	135.87	0.75	0.0018	0.48	6.60	71.55
4/30 7:49	302.52	0.5145	136.54	0.58	0.0014	0.37	6.58	71.85
4/30 7:50	301.51	0.5131	136.45	0.56	0.0013	0.35	6.59	72.00
4/30 7:51	300.68	0.5120	135.95	0.59	0.0014	0.37	6.60	71.89
4/30 7:52	301.04	0.5127	135.45	0.59	0.0014	0.37	6.60	71.47
4/30 7:53	301.03	0.5159	135.34	0.62	0.0015	0.39	6.69	71.19
4/30 7:54	299.14	0.5105	134.10	0.73	0.0017	0.45	6.63	71.34
4/30 7:55	297.72	0.5091	134.28	0.96	0.0023	0.61	6.66	71.63
4/30 7:56	297.13	0.5096	134.44	0.81	0.0019	0.50	6.70	71.70
4/30 7:57	300.86	0.5127	135.18	0.82	0.0019	0.50	6.61	71.66
4/30 7:58	301.10	0.5124	135.42	0.75	0.0018	0.48	6.59	71.72
4/30 7:59	301.07	0.5092	135.64	0.67	0.0016	0.43	6.50	71.95
4/30 8:00	302.64	0.5076	136.32	0.73	0.0017	0.46	6.38	71.93
4/30 8:01	301.71	0.5046	135.32	0.79	0.0018	0.48	6.34	71.61
4/30 8:02	301.83	0.5083	136.10	0.76	0.0018	0.48	6.44	71.50
4/30 8:03	305.41	0.5151	139.08	0.77	0.0018	0.49	6.46	72.10
4/30 8:04	303.21	0.5114	139.00	0.81	0.0019	0.52	6.46	72.80
Average (all)	300.95	0.5111	135.80	0.75	0.0018	0.47	6.56	71.78
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	297.13	0.5046	134.10	0.56	0.0013	0.35	6.34	71.19
Maximum (all)	305.41	0.5159	139.08	0.97	0.0023	0.61	6.70	72.80
Average (valid values only)	300.95	0.5111	135.80	0.75	0.0018	0.47	6.56	71.78
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

R5

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 7:44 AM thru 4/30/2015 8:04 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 7:44	12.94
4/30 7:45	12.95
4/30 7:46	12.96
4/30 7:47	12.96
4/30 7:48	12.96
4/30 7:49	12.96
4/30 7:50	12.96
4/30 7:51	12.96
4/30 7:52	12.97
4/30 7:53	12.93
4/30 7:54	12.92
4/30 7:55	12.92
4/30 7:56	12.91
4/30 7:57	12.91
4/30 7:58	12.93
4/30 7:59	12.99
4/30 8:00	13.10
4/30 8:01	13.14
4/30 8:02	13.14
4/30 8:03	13.14
4/30 8:04	13.10
Average (all)	12.99
Total (all)	--
Minimum (all)	12.91
Maximum (all)	13.14
Average (valid values only)	12.99
Total (valid values only)	--
Count (valid values only)	21

R6

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 9:12 AM thru 4/30/2015 9:32 AM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/30 9:12	300.99	0.5090	139.35	0.84	0.0020	0.55	6.50	73.44
4/30 9:13	301.87	0.5045	138.75	0.92	0.0021	0.58	6.33	73.33
4/30 9:14	302.59	0.5061	140.42	0.93	0.0022	0.61	6.34	73.64
4/30 9:15	303.34	0.5098	142.50	0.91	0.0021	0.59	6.41	74.19
4/30 9:16	303.76	0.5109	143.31	0.97	0.0023	0.65	6.42	74.45
4/30 9:17	301.69	0.5088	142.17	0.96	0.0023	0.64	6.46	74.33
4/30 9:18	301.89	0.5088	141.83	0.89	0.0021	0.59	6.45	74.21
4/30 9:19	302.47	0.5083	141.92	0.85	0.0020	0.56	6.41	74.33
4/30 9:20	302.97	0.5152	143.26	0.83	0.0020	0.56	6.58	74.48
4/30 9:21	300.52	0.5114	141.11	0.93	0.0022	0.61	6.59	74.30
4/30 9:22	300.34	0.5051	139.19	0.96	0.0022	0.61	6.42	73.64
4/30 9:23	299.14	0.5034	137.64	0.96	0.0022	0.60	6.43	73.01
4/30 9:24	299.44	0.5064	138.08	0.95	0.0022	0.60	6.50	72.81
4/30 9:25	301.60	0.5097	139.86	0.97	0.0023	0.63	6.49	73.27
4/30 9:26	302.34	0.5099	140.66	0.99	0.0023	0.63	6.46	73.66
4/30 9:27	300.66	0.5029	139.17	1.03	0.0024	0.66	6.34	73.56
4/30 9:28	298.65	0.4978	137.86	1.04	0.0024	0.66	6.29	73.28
4/30 9:29	296.76	0.4970	137.67	0.96	0.0022	0.61	6.36	73.30
4/30 9:30	298.07	0.4979	138.28	1.01	0.0023	0.64	6.32	73.49
4/30 9:31	299.02	0.5046	139.73	1.03	0.0024	0.66	6.47	73.61
4/30 9:32	298.78	0.5004	138.05	1.03	0.0024	0.66	6.36	73.39
Average (all)	300.80	0.5061	140.04	0.95	0.0022	0.61	6.43	73.70
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	296.76	0.4970	137.64	0.83	0.0020	0.55	6.29	72.81
Maximum (all)	303.76	0.5152	143.31	1.04	0.0024	0.66	6.59	74.48
Average (valid values only)	300.80	0.5061	140.04	0.95	0.0022	0.61	6.43	73.70
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

R6

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 9:12 AM thru 4/30/2015 9:32 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 9:12	13.08
4/30 9:13	13.16
4/30 9:14	13.22
4/30 9:15	13.22
4/30 9:16	13.22
4/30 9:17	13.19
4/30 9:18	13.18
4/30 9:19	13.18
4/30 9:20	13.10
4/30 9:21	13.03
4/30 9:22	13.13
4/30 9:23	13.14
4/30 9:24	13.14
4/30 9:25	13.14
4/30 9:26	13.14
4/30 9:27	13.20
4/30 9:28	13.26
4/30 9:29	13.26
4/30 9:30	13.26
4/30 9:31	13.20
4/30 9:32	13.19
Average (all)	13.17
Total (all)	--
Minimum (all)	13.03
Maximum (all)	13.26
Average (valid values only)	13.17
Total (valid values only)	--
Count (valid values only)	21

R7

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 10:24 AM thru 4/30/2015 10:44 AM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/30 10:24	305.77	0.5139	145.05	1.13	0.0026	0.73	6.41	74.80
4/30 10:25	303.87	0.5135	144.48	1.21	0.0028	0.79	6.49	74.85
4/30 10:26	301.30	0.5142	143.02	1.19	0.0028	0.78	6.63	74.67
4/30 10:27	300.84	0.5145	141.81	1.13	0.0027	0.74	6.66	74.11
4/30 10:28	300.59	0.5105	139.64	1.12	0.0026	0.71	6.56	73.49
4/30 10:29	300.56	0.5065	138.81	1.10	0.0026	0.71	6.45	73.35
4/30 10:30	301.82	0.5087	139.92	1.15	0.0027	0.74	6.45	73.45
4/30 10:31	300.54	0.5068	139.13	1.13	0.0027	0.74	6.46	73.25
4/30 10:32	301.52	0.5117	139.86	1.14	0.0027	0.74	6.55	72.93
4/30 10:33	303.40	0.5160	140.39	1.16	0.0027	0.73	6.58	72.82
4/30 10:34	300.36	0.5151	139.17	1.13	0.0027	0.73	6.70	72.98
4/30 10:35	298.93	0.5098	138.10	1.12	0.0027	0.73	6.62	73.17
4/30 10:36	299.07	0.5068	137.83	1.15	0.0027	0.73	6.53	73.07
4/30 10:37	297.15	0.5025	136.32	1.17	0.0028	0.76	6.50	72.66
4/30 10:38	300.24	0.5092	138.04	1.12	0.0026	0.70	6.54	72.50
4/30 10:39	297.76	0.5060	137.41	1.06	0.0025	0.68	6.57	72.68
4/30 10:40	297.85	0.5094	137.73	1.02	0.0024	0.65	6.66	72.64
4/30 10:41	298.48	0.5115	137.36	1.13	0.0027	0.73	6.69	72.37
4/30 10:42	296.92	0.5085	136.45	1.10	0.0026	0.70	6.68	72.37
4/30 10:43	297.35	0.5085	136.60	1.17	0.0028	0.75	6.66	72.45
4/30 10:44	296.19	0.5080	136.31	1.07	0.0026	0.70	6.70	72.31
Average (all)	300.02	0.5101	139.21	1.13	0.0027	0.73	6.58	73.19
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	296.19	0.5025	136.31	1.02	0.0024	0.65	6.41	72.31
Maximum (all)	305.77	0.5160	145.05	1.21	0.0028	0.79	6.70	74.85
Average (valid values only)	300.02	0.5101	139.21	1.13	0.0027	0.73	6.58	73.19
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

R7

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 10:24 AM thru 4/30/2015 10:44 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 10:24	13.24
4/30 10:25	13.19
4/30 10:26	13.07
4/30 10:27	13.05
4/30 10:28	13.06
4/30 10:29	13.11
4/30 10:30	13.14
4/30 10:31	13.15
4/30 10:32	13.15
4/30 10:33	13.11
4/30 10:34	12.99
4/30 10:35	12.99
4/30 10:36	13.06
4/30 10:37	13.10
4/30 10:38	13.12
4/30 10:39	13.11
4/30 10:40	13.06
4/30 10:41	13.02
4/30 10:42	13.01
4/30 10:43	13.01
4/30 10:44	13.02
Average (all)	13.08
Total (all)	--
Minimum (all)	12.99
Maximum (all)	13.24
Average (valid values only)	13.08
Total (valid values only)	--
Count (valid values only)	21

Run 8

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 11:31 AM thru 4/30/2015 11:51 AM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/30 11:31	300.78	0.5080	138.14	1.10	0.0026	0.71	6.48	72.50
4/30 11:32	299.48	0.5089	137.26	1.08	0.0026	0.70	6.57	72.13
4/30 11:33	299.31	0.5119	136.96	1.17	0.0028	0.75	6.66	71.94
4/30 11:34	299.35	0.5094	135.80	1.07	0.0025	0.67	6.59	71.90
4/30 11:35	301.78	0.5150	137.37	1.07	0.0025	0.67	6.63	71.83
4/30 11:36	300.05	0.5121	136.33	1.14	0.0027	0.72	6.63	71.80
4/30 11:37	299.26	0.5111	136.35	1.10	0.0026	0.69	6.64	71.84
4/30 11:38	298.69	0.5069	135.58	1.09	0.0026	0.70	6.55	71.97
4/30 11:39	298.71	0.5080	136.69	1.04	0.0025	0.67	6.58	72.29
4/30 11:40	299.28	0.5151	138.27	1.09	0.0026	0.70	6.75	72.51
4/30 11:41	299.68	0.5158	137.39	1.05	0.0025	0.67	6.75	72.17
4/30 11:42	299.80	0.5204	137.13	1.07	0.0026	0.69	6.87	71.84
4/30 11:43	298.30	0.5167	135.53	1.12	0.0027	0.71	6.84	71.62
4/30 11:44	299.18	0.5156	134.58	1.12	0.0027	0.70	6.77	71.16
4/30 11:45	301.63	0.5162	135.23	1.15	0.0027	0.71	6.67	70.98
4/30 11:46	300.64	0.5245	135.98	1.15	0.0028	0.73	6.94	71.18
4/30 11:47	299.16	0.5196	134.61	1.12	0.0027	0.70	6.88	71.24
4/30 11:48	298.43	0.5147	133.68	1.09	0.0026	0.68	6.78	70.92
4/30 11:49	298.11	0.5138	133.38	1.02	0.0024	0.62	6.77	70.72
4/30 11:50	301.43	0.5184	134.98	1.11	0.0027	0.70	6.74	70.82
4/30 11:51	300.60	0.5144	134.51	1.09	0.0026	0.68	6.67	70.96
Average (all)	299.70	0.5141	135.99	1.10	0.0026	0.69	6.70	71.63
Total (all)	–	–	–	–	–	–	–	–
Minimum (all)	298.11	0.5069	133.38	1.02	0.0024	0.62	6.48	70.72
Maximum (all)	301.78	0.5245	138.27	1.17	0.0028	0.75	6.94	72.51
Average (valid values only)	299.70	0.5141	135.99	1.10	0.0026	0.69	6.70	71.63
Total (valid values only)	–	–	–	–	–	–	–	–
Count (valid values only)	21	21	21	21	21	21	21	21

R8

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 11:31 AM thru 4/30/2015 11:51 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 11:31	13.16
4/30 11:32	13.12
4/30 11:33	13.05
4/30 11:34	13.01
4/30 11:35	13.03
4/30 11:36	13.01
4/30 11:37	13.03
4/30 11:38	13.04
4/30 11:39	13.06
4/30 11:40	12.99
4/30 11:41	12.95
4/30 11:42	12.87
4/30 11:43	12.85
4/30 11:44	12.87
4/30 11:45	12.95
4/30 11:46	12.78
4/30 11:47	12.76
4/30 11:48	12.85
4/30 11:49	12.88
4/30 11:50	12.90
4/30 11:51	12.93
Average (all)	12.96
Total (all)	--
Minimum (all)	12.76
Maximum (all)	13.16
Average (valid values only)	12.96
Total (valid values only)	--
Count (valid values only)	21

R9

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 12:35 PM thru 4/30/2015 12:55 PM

Timestamp	(Boiler 1) 60-NOx ppm 1-Min	(Boiler 1) NOx lb/mmBtu 1-Min	(Boiler 1) NOx lb/hr 1-Min	(Boiler 1) SO2 ppm 1-Min	(Boiler 1) SO2 lb/mmBtu 1-Min	(Boiler 1) SO2 lb/hr 1-Min	(Boiler 1) O2% 1-Min	(Boiler 1) Stack Flow kscf/min 1-Min
4/30 12:35	298.05	0.5256	126.41	1.15	0.0028	0.67	7.09	66.92
4/30 12:36	297.93	0.5197	126.38	1.14	0.0028	0.68	6.94	67.24
4/30 12:37	297.86	0.5200	126.99	1.12	0.0027	0.66	6.95	67.47
4/30 12:38	296.71	0.5202	127.36	1.12	0.0027	0.66	7.01	67.64
4/30 12:39	298.38	0.5228	128.51	1.08	0.0026	0.64	7.00	67.97
4/30 12:40	300.74	0.5258	129.67	1.06	0.0026	0.64	6.97	68.19
4/30 12:41	300.14	0.5225	128.83	1.07	0.0026	0.64	6.91	68.07
4/30 12:42	299.47	0.5247	129.18	1.07	0.0026	0.64	7.00	67.91
4/30 12:43	299.64	0.5246	129.09	1.08	0.0026	0.64	6.99	67.88
4/30 12:44	299.26	0.5235	128.54	1.09	0.0027	0.66	6.98	67.73
4/30 12:45	299.87	0.5242	128.54	1.12	0.0027	0.66	6.97	67.64
4/30 12:46	297.68	0.5182	127.26	1.07	0.0026	0.64	6.91	67.69
4/30 12:47	298.81	0.5150	127.36	1.09	0.0026	0.64	6.77	67.74
4/30 12:48	298.76	0.5113	128.02	1.10	0.0026	0.65	6.67	68.00
4/30 12:49	299.47	0.5165	130.60	1.02	0.0024	0.61	6.78	68.67
4/30 12:50	298.96	0.5145	131.19	1.07	0.0026	0.66	6.75	69.30
4/30 12:51	298.79	0.5164	132.21	1.09	0.0026	0.67	6.81	69.64
4/30 12:52	299.90	0.5187	132.51	1.03	0.0025	0.64	6.82	69.65
4/30 12:53	301.05	0.5167	131.91	0.98	0.0023	0.59	6.71	69.60
4/30 12:54	303.35	0.5162	133.46	1.04	0.0025	0.65	6.59	69.89
4/30 12:55	304.47	0.5192	135.80	1.05	0.0025	0.65	6.62	70.43
Average (all)	299.49	0.5198	129.52	1.08	0.0026	0.65	6.87	68.35
Total (all)	--	--	--	--	--	--	--	--
Minimum (all)	296.71	0.5113	126.38	0.98	0.0023	0.59	6.59	66.92
Maximum (all)	304.47	0.5258	135.80	1.15	0.0028	0.68	7.09	70.43
Average (valid values only)	299.49	0.5198	129.52	1.08	0.0026	0.65	6.87	68.35
Total (valid values only)	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21

R9

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 12:35 PM thru 4/30/2015 12:55 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 12:35	12.61
4/30 12:36	12.69
4/30 12:37	12.70
4/30 12:38	12.70
4/30 12:39	12.69
4/30 12:40	12.69
4/30 12:41	12.71
4/30 12:42	12.72
4/30 12:43	12.72
4/30 12:44	12.72
4/30 12:45	12.72
4/30 12:46	12.73
4/30 12:47	12.81
4/30 12:48	12.92
4/30 12:49	12.92
4/30 12:50	12.91
4/30 12:51	12.90
4/30 12:52	12.87
4/30 12:53	12.87
4/30 12:54	12.98
4/30 12:55	13.03
Average (all)	12.79
Total (all)	--
Minimum (all)	12.61
Maximum (all)	13.03
Average (valid values only)	12.79
Total (valid values only)	--
Count (valid values only)	21

RI

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 8:44 AM thru 5/4/2015 9:04 AM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 8:44	277.96	0.5394	132.98	7.70	0.0208	5.13	11.37	8.35	76.35
5/4 8:45	275.26	0.5401	132.75	7.78	0.0212	5.21	11.32	8.49	76.45
5/4 8:46	274.07	0.5361	132.04	7.82	0.0213	5.25	11.31	8.45	76.68
5/4 8:47	277.76	0.5424	133.47	7.78	0.0211	5.19	11.31	8.43	76.61
5/4 8:48	276.43	0.5398	132.59	7.74	0.0210	5.16	11.31	8.43	76.47
5/4 8:49	276.78	0.5401	132.73	7.57	0.0206	5.06	11.31	8.42	76.51
5/4 8:50	276.16	0.5389	132.02	7.48	0.0203	4.97	11.31	8.42	76.27
5/4 8:51	275.48	0.5337	130.66	7.44	0.0201	4.92	11.38	8.33	75.75
5/4 8:52	275.90	0.5337	130.99	7.60	0.0205	5.03	11.44	8.31	75.54
5/4 8:53	277.90	0.5388	131.79	7.40	0.0200	4.89	11.38	8.34	75.68
5/4 8:54	277.66	0.5384	132.53	7.12	0.0192	4.73	11.42	8.34	75.90
5/4 8:55	277.37	0.5391	132.83	7.35	0.0199	4.90	11.42	8.37	75.97
5/4 8:56	278.33	0.5375	132.94	7.57	0.0203	5.02	11.45	8.29	76.06
5/4 8:57	281.51	0.5269	134.34	7.69	0.0200	5.10	11.74	7.89	76.47
5/4 8:58	282.23	0.5263	135.87	7.84	0.0203	5.24	11.79	7.84	77.10
5/4 8:59	283.14	0.5320	138.86	7.88	0.0206	5.38	11.76	7.94	78.15
5/4 9:00	274.05	0.5356	138.34	7.74	0.0210	5.42	11.35	8.44	80.13
5/4 9:01	272.15	0.5336	140.60	7.56	0.0206	5.43	11.28	8.48	82.25
5/4 9:02	266.08	0.5413	139.28	7.36	0.0208	5.35	10.90	8.93	83.12
5/4 9:03	260.99	0.5314	136.93	6.96	0.0197	5.08	10.90	8.94	83.24
5/4 9:04	257.91	0.5212	134.73	6.58	0.0185	4.78	10.91	8.85	83.43
Average (all)	275.01	0.5355	134.25	7.52	0.0204	5.11	11.35	8.39	77.82
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	257.91	0.5212	130.66	6.58	0.0185	4.73	10.90	7.84	75.54
Maximum (all)	283.14	0.5424	140.60	7.88	0.0213	5.43	11.79	8.94	83.43
Average (valid values only)	275.01	0.5355	134.25	7.52	0.0204	5.11	11.35	8.39	77.82
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

RR

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 9:28 AM thru 5/4/2015 9:48 AM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 9:28	278.79	0.5251	136.86	7.22	0.0189	4.93	11.73	7.97	78.24
5/4 9:29	278.11	0.5218	136.10	7.11	0.0186	4.85	11.74	7.92	78.23
5/4 9:30	277.63	0.5213	136.14	7.24	0.0189	4.94	11.75	7.93	78.26
5/4 9:31	278.65	0.5220	136.65	7.22	0.0188	4.92	11.76	7.90	78.38
5/4 9:32	279.31	0.5196	136.64	7.31	0.0189	4.97	11.83	7.81	78.27
5/4 9:33	278.36	0.5186	135.62	7.42	0.0192	5.02	11.83	7.83	77.84
5/4 9:34	279.07	0.5208	136.03	7.14	0.0185	4.83	11.84	7.85	77.68
5/4 9:35	279.50	0.5260	137.33	7.24	0.0190	4.96	11.81	7.96	77.84
5/4 9:36	277.80	0.5228	136.54	7.36	0.0193	5.04	11.78	7.96	78.07
5/4 9:37	277.26	0.5230	136.76	7.57	0.0199	5.20	11.77	7.99	78.23
5/4 9:38	277.36	0.5232	137.08	7.54	0.0198	5.19	11.77	7.99	78.38
5/4 9:39	277.19	0.5197	136.38	7.58	0.0198	5.20	11.77	7.91	78.51
5/4 9:40	277.80	0.5232	137.48	7.49	0.0196	5.15	11.77	7.97	78.61
5/4 9:41	276.39	0.5222	137.09	7.31	0.0192	5.04	11.74	8.01	78.74
5/4 9:42	277.23	0.5262	137.76	7.28	0.0192	5.03	11.69	8.07	78.86
5/4 9:43	276.86	0.5214	136.53	7.24	0.0190	4.98	11.71	7.97	78.74
5/4 9:44	276.37	0.5234	136.57	6.93	0.0183	4.78	11.71	8.04	78.46
5/4 9:45	277.62	0.5237	136.49	7.02	0.0184	4.80	11.71	7.99	78.37
5/4 9:46	277.81	0.5176	136.28	7.24	0.0188	4.95	11.83	7.83	78.37
5/4 9:47	276.13	0.5221	136.45	7.43	0.0195	5.10	11.75	8.02	78.32
5/4 9:48	274.48	0.5210	135.37	7.49	0.0198	5.14	11.69	8.07	78.26
Average (all)	277.61	0.5221	136.58	7.30	0.0191	5.00	11.76	7.95	78.32
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	274.48	0.5176	135.37	6.93	0.0183	4.78	11.69	7.81	77.68
Maximum (all)	279.50	0.5262	137.76	7.58	0.0199	5.20	11.84	8.07	78.86
Average (valid values only)	277.61	0.5221	136.58	7.30	0.0191	5.00	11.76	7.95	78.32
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

R3

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 10:20 AM thru 5/4/2015 10:40 AM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 10:20	276.34	0.5079	139.70	7.41	0.0189	5.20	12.01	7.65	80.64
5/4 10:21	275.73	0.5064	139.53	7.34	0.0188	5.18	12.01	7.64	80.78
5/4 10:22	276.01	0.5061	139.67	7.25	0.0185	5.11	12.01	7.62	80.91
5/4 10:23	275.77	0.5080	139.74	7.05	0.0181	4.98	11.98	7.68	80.85
5/4 10:24	278.46	0.5102	140.48	6.94	0.0177	4.87	12.05	7.61	80.46
5/4 10:25	274.82	0.5017	137.84	6.91	0.0176	4.84	12.07	7.56	80.15
5/4 10:26	274.15	0.5042	137.55	7.03	0.0180	4.91	12.00	7.66	80.05
5/4 10:27	276.79	0.5080	139.19	7.27	0.0186	5.10	12.04	7.63	80.13
5/4 10:28	278.48	0.5095	140.12	7.38	0.0188	5.17	12.05	7.59	80.36
5/4 10:29	277.56	0.5109	140.23	7.38	0.0189	5.19	12.01	7.67	80.47
5/4 10:30	275.90	0.5037	138.59	7.47	0.0190	5.23	12.05	7.56	80.40
5/4 10:31	275.20	0.5054	139.09	7.24	0.0185	5.09	12.05	7.64	80.42
5/4 10:32	276.45	0.5073	139.79	7.32	0.0187	5.15	12.05	7.63	80.52
5/4 10:33	276.07	0.5066	139.74	7.38	0.0188	5.19	12.05	7.63	80.60
5/4 10:34	275.05	0.5055	139.59	7.02	0.0180	4.97	12.04	7.65	80.76
5/4 10:35	274.73	0.5053	139.72	7.14	0.0183	5.06	12.03	7.66	80.93
5/4 10:36	274.51	0.5053	139.28	7.27	0.0186	5.13	12.00	7.67	80.88
5/4 10:37	274.88	0.5052	138.84	7.30	0.0187	5.14	12.00	7.65	80.64
5/4 10:38	276.39	0.5072	138.99	7.48	0.0191	5.23	12.00	7.63	80.41
5/4 10:39	275.68	0.5055	138.54	7.45	0.0190	5.21	12.00	7.62	80.42
5/4 10:40	274.08	0.5037	138.27	7.47	0.0191	5.24	12.00	7.65	80.55
Average (all)	275.86	0.5064	139.26	7.26	0.0186	5.10	12.02	7.63	80.54
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	274.08	0.5017	137.55	6.91	0.0176	4.84	11.98	7.56	80.05
Maximum (all)	278.48	0.5109	140.48	7.48	0.0191	5.24	12.07	7.68	80.93
Average (valid values only)	275.86	0.5064	139.26	7.26	0.0186	5.10	12.02	7.63	80.54
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

R4

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 11:13 AM thru 5/4/2015 11:33 AM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 11:13	272.46	0.5046	137.33	7.20	0.0186	5.06	11.91	7.75	80.46
5/4 11:14	271.97	0.5040	137.26	7.08	0.0183	4.98	11.91	7.76	80.52
5/4 11:15	273.91	0.5080	138.22	7.17	0.0185	5.03	11.91	7.77	80.44
5/4 11:16	273.28	0.5057	137.26	7.29	0.0188	5.10	11.90	7.74	80.31
5/4 11:17	273.48	0.5053	137.32	7.31	0.0188	5.11	11.90	7.72	80.41
5/4 11:18	272.26	0.5050	137.56	7.24	0.0187	5.09	11.91	7.77	80.53
5/4 11:19	272.51	0.5058	137.17	7.27	0.0188	5.10	11.87	7.78	80.45
5/4 11:20	273.60	0.5048	137.67	7.02	0.0180	4.91	11.94	7.70	80.43
5/4 11:21	273.73	0.5085	138.49	7.11	0.0184	5.01	11.92	7.79	80.45
5/4 11:22	275.11	0.5091	138.52	7.23	0.0186	5.06	11.91	7.74	80.44
5/4 11:23	274.36	0.4982	137.58	7.19	0.0182	5.03	12.07	7.49	80.56
5/4 11:24	274.57	0.4968	139.46	6.97	0.0175	4.91	12.21	7.44	80.95
5/4 11:25	275.98	0.5004	141.01	7.02	0.0177	4.99	12.19	7.47	81.40
5/4 11:26	275.97	0.4986	140.78	7.28	0.0183	5.17	12.19	7.42	81.56
5/4 11:27	275.42	0.5070	141.56	7.33	0.0188	5.25	12.04	7.67	81.66
5/4 11:28	274.82	0.5156	141.63	7.26	0.0190	5.22	11.83	7.92	81.76
5/4 11:29	273.77	0.5082	139.85	7.28	0.0188	5.17	11.87	7.78	81.63
5/4 11:30	274.16	0.5077	139.50	7.21	0.0186	5.11	11.90	7.75	81.30
5/4 11:31	273.84	0.5110	139.14	7.12	0.0185	5.04	11.85	7.85	80.91
5/4 11:32	275.73	0.5045	138.50	7.23	0.0184	5.05	11.99	7.59	80.62
5/4 11:33	273.38	0.5036	138.12	7.23	0.0185	5.07	12.01	7.68	80.41
Average (all)	274.01	0.5054	138.76	7.19	0.0185	5.07	11.96	7.69	80.82
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	271.97	0.4968	137.17	6.97	0.0175	4.91	11.83	7.42	80.31
Maximum (all)	275.98	0.5156	141.63	7.33	0.0190	5.25	12.21	7.92	81.76
Average (valid values only)	274.01	0.5054	138.76	7.19	0.0185	5.07	11.96	7.69	80.82
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

RS

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 12:09 PM thru 5/4/2015 12:29 PM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 12:09	272.58	0.5071	141.98	7.16	0.0185	5.18	11.93	7.81	82.64
5/4 12:10	273.03	0.5026	139.35	6.94	0.0178	4.94	11.91	7.67	81.97
5/4 12:11	271.78	0.4947	137.46	6.91	0.0175	4.86	12.06	7.52	81.13
5/4 12:12	270.59	0.4918	136.34	6.92	0.0175	4.85	12.12	7.50	80.54
5/4 12:13	269.84	0.4922	135.78	7.10	0.0180	4.97	12.11	7.55	80.21
5/4 12:14	269.78	0.4914	134.49	6.90	0.0175	4.79	12.07	7.53	79.84
5/4 12:15	273.59	0.4976	136.07	6.91	0.0175	4.79	12.08	7.51	79.71
5/4 12:16	272.72	0.4960	135.82	7.05	0.0178	4.87	12.09	7.51	79.75
5/4 12:17	272.69	0.4974	136.08	7.21	0.0183	5.01	12.09	7.55	79.68
5/4 12:18	270.91	0.4975	135.74	7.29	0.0186	5.07	12.06	7.64	79.66
5/4 12:19	270.41	0.4948	135.23	7.27	0.0185	5.06	12.05	7.59	79.86
5/4 12:20	270.33	0.4965	135.78	7.29	0.0186	5.09	12.04	7.64	79.98
5/4 12:21	267.47	0.4886	133.63	7.38	0.0188	5.14	12.03	7.57	80.05
5/4 12:22	269.06	0.4945	135.49	7.46	0.0191	5.23	12.03	7.65	80.20
5/4 12:23	269.47	0.4945	135.70	7.54	0.0193	5.30	12.03	7.63	80.32
5/4 12:24	269.14	0.4958	136.12	7.28	0.0187	5.13	12.01	7.68	80.49
5/4 12:25	269.94	0.4961	136.21	7.22	0.0185	5.08	12.01	7.65	80.50
5/4 12:26	270.02	0.4940	135.06	7.41	0.0189	5.17	12.01	7.59	80.16
5/4 12:27	269.60	0.4966	135.49	7.46	0.0191	5.21	12.01	7.68	79.99
5/4 12:28	270.44	0.4956	135.09	7.43	0.0189	5.15	12.00	7.61	79.98
5/4 12:29	267.58	0.4929	134.29	7.29	0.0187	5.09	12.00	7.68	79.94
Average (all)	270.52	0.4956	136.06	7.21	0.0184	5.05	12.04	7.61	80.31
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	267.47	0.4886	133.63	6.90	0.0175	4.79	11.91	7.50	79.66
Maximum (all)	273.59	0.5071	141.98	7.54	0.0193	5.30	12.12	7.81	82.64
Average (valid values only)	270.52	0.4956	136.06	7.21	0.0184	5.05	12.04	7.61	80.31
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

R6

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 12:59 PM thru 5/4/2015 1:19 PM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 12:59	268.52	0.4931	132.34	6.97	0.0178	4.78	11.92	7.64	79.28
5/4 13:00	268.29	0.4938	132.38	7.44	0.0191	5.12	11.95	7.67	78.99
5/4 13:01	267.83	0.4908	132.17	7.50	0.0191	5.14	12.00	7.61	79.02
5/4 13:02	267.85	0.4897	132.09	7.45	0.0190	5.13	12.00	7.58	79.15
5/4 13:03	269.10	0.4935	133.21	7.30	0.0186	5.02	12.01	7.62	79.14
5/4 13:04	268.45	0.4919	132.49	6.96	0.0177	4.77	12.01	7.61	78.97
5/4 13:05	268.78	0.4918	132.27	7.05	0.0179	4.81	12.02	7.59	78.79
5/4 13:06	267.79	0.4903	131.64	7.26	0.0185	4.97	12.02	7.60	78.65
5/4 13:07	267.97	0.4903	131.50	7.38	0.0188	5.04	12.03	7.59	78.50
5/4 13:08	268.61	0.4904	131.36	7.61	0.0193	5.17	12.03	7.56	78.40
5/4 13:09	270.20	0.4947	132.30	7.56	0.0193	5.16	12.02	7.60	78.34
5/4 13:10	268.81	0.4915	131.47	7.62	0.0194	5.19	12.03	7.58	78.29
5/4 13:11	270.55	0.4943	131.87	7.72	0.0196	5.23	12.02	7.57	78.15
5/4 13:12	268.60	0.4937	130.98	7.94	0.0203	5.39	11.97	7.65	78.04
5/4 13:13	268.39	0.4892	130.75	7.87	0.0200	5.35	12.05	7.54	78.10
5/4 13:14	269.13	0.4909	131.52	7.49	0.0190	5.09	12.05	7.55	78.29
5/4 13:15	268.64	0.4875	131.72	7.45	0.0188	5.08	12.10	7.48	78.63
5/4 13:16	269.84	0.4828	132.97	7.63	0.0190	5.23	12.26	7.29	79.10
5/4 13:17	269.26	0.4832	133.75	7.63	0.0191	5.29	12.26	7.33	79.50
5/4 13:18	269.57	0.4856	134.40	7.82	0.0196	5.42	12.20	7.38	79.88
5/4 13:19	268.67	0.4890	135.30	7.73	0.0196	5.42	12.14	7.52	80.25
Average (all)	268.80	0.4904	132.31	7.49	0.0190	5.13	12.05	7.55	78.83
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	267.79	0.4828	130.75	6.96	0.0177	4.77	11.92	7.29	78.04
Maximum (all)	270.55	0.4947	135.30	7.94	0.0203	5.42	12.26	7.67	80.25
Average (valid values only)	268.80	0.4904	132.31	7.49	0.0190	5.13	12.05	7.55	78.83
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

R7

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 1:45 PM thru 5/4/2015 2:05 PM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 13:45	265.82	0.4849	130.62	7.93	0.0201	5.41	12.06	7.55	78.65
5/4 13:46	264.79	0.4823	130.16	8.29	0.0210	5.67	12.07	7.53	78.73
5/4 13:47	266.42	0.4853	130.88	8.08	0.0205	5.53	12.06	7.53	78.74
5/4 13:48	266.80	0.4889	131.34	8.15	0.0208	5.59	12.01	7.61	78.76
5/4 13:49	264.98	0.4826	130.34	8.14	0.0206	5.56	12.07	7.53	78.79
5/4 13:50	265.77	0.4855	130.94	8.01	0.0204	5.50	12.03	7.57	78.94
5/4 13:51	265.09	0.4857	130.59	7.94	0.0202	5.43	12.00	7.61	78.89
5/4 13:52	265.85	0.4875	130.85	7.92	0.0202	5.42	12.00	7.62	78.76
5/4 13:53	265.47	0.4887	130.37	7.62	0.0195	5.20	11.94	7.67	78.67
5/4 13:54	265.44	0.4890	130.07	7.46	0.0191	5.08	11.93	7.68	78.51
5/4 13:55	266.47	0.4901	130.66	7.60	0.0194	5.17	11.96	7.66	78.49
5/4 13:56	264.76	0.4862	129.25	7.77	0.0199	5.29	11.93	7.64	78.46
5/4 13:57	263.60	0.4870	129.13	7.87	0.0202	5.36	11.91	7.72	78.39
5/4 13:58	264.70	0.4705	129.05	8.17	0.0202	5.54	12.28	7.20	78.65
5/4 13:59	265.66	0.4605	130.90	8.58	0.0207	5.88	12.59	6.85	79.50
5/4 14:00	266.55	0.4711	133.56	8.77	0.0216	6.12	12.43	7.12	80.31
5/4 14:01	267.32	0.4748	135.04	8.67	0.0214	6.09	12.39	7.19	80.83
5/4 14:02	267.57	0.4735	134.73	8.51	0.0210	5.98	12.36	7.14	81.06
5/4 14:03	268.83	0.4864	136.68	8.16	0.0205	5.76	12.20	7.44	81.10
5/4 14:04	265.61	0.4915	134.86	7.56	0.0195	5.35	11.95	7.74	80.85
5/4 14:05	265.71	0.4887	132.82	7.54	0.0193	5.25	11.91	7.66	80.35
Average (all)	265.87	0.4829	131.56	8.04	0.0203	5.53	12.10	7.49	79.31
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	263.60	0.4605	129.05	7.46	0.0191	5.08	11.91	6.85	78.39
Maximum (all)	268.83	0.4915	136.68	8.77	0.0216	6.12	12.59	7.74	81.10
Average (valid values only)	265.87	0.4829	131.56	8.04	0.0203	5.53	12.10	7.49	79.31
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

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CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 2:31 PM thru 5/4/2015 2:51 PM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 14:31	266.26	0.4897	134.08	8.06	0.0206	5.64	12.00	7.66	80.34
5/4 14:32	264.39	0.4856	132.39	8.12	0.0207	5.64	11.97	7.64	80.20
5/4 14:33	265.01	0.4849	131.94	8.00	0.0204	5.55	11.97	7.59	80.04
5/4 14:34	263.69	0.4828	131.06	7.62	0.0194	5.27	11.97	7.60	79.85
5/4 14:35	264.44	0.4868	131.73	7.44	0.0191	5.17	11.96	7.67	79.67
5/4 14:36	265.80	0.4882	131.89	7.57	0.0193	5.21	11.95	7.64	79.60
5/4 14:37	265.02	0.4838	130.79	7.47	0.0190	5.14	11.96	7.56	79.59
5/4 14:38	263.02	0.4823	130.89	7.46	0.0190	5.16	12.00	7.62	79.63
5/4 14:39	262.36	0.4804	130.35	7.50	0.0191	5.18	12.00	7.60	79.62
5/4 14:40	263.22	0.4812	130.52	7.71	0.0196	5.32	12.00	7.58	79.59
5/4 14:41	263.75	0.4844	131.50	7.87	0.0201	5.46	12.00	7.64	79.66
5/4 14:42	262.84	0.4816	131.01	8.05	0.0205	5.58	12.00	7.61	79.82
5/4 14:43	262.40	0.4812	131.13	8.02	0.0205	5.59	12.00	7.62	79.96
5/4 14:44	262.93	0.4840	131.01	7.70	0.0197	5.33	11.92	7.67	79.96
5/4 14:45	265.67	0.4850	131.51	7.78	0.0198	5.37	11.96	7.56	79.83
5/4 14:46	264.50	0.4807	130.85	7.85	0.0198	5.39	12.02	7.50	79.74
5/4 14:47	265.00	0.4830	131.62	7.88	0.0200	5.45	12.03	7.54	79.76
5/4 14:48	265.16	0.4837	131.92	7.78	0.0197	5.37	12.03	7.55	79.83
5/4 14:49	265.00	0.4845	132.08	7.70	0.0196	5.34	12.02	7.58	79.86
5/4 14:50	266.77	0.4877	132.72	7.65	0.0195	5.31	12.02	7.58	79.72
5/4 14:51	266.63	0.4846	131.97	7.82	0.0198	5.39	12.04	7.50	79.64
Average (all)	264.47	0.4841	131.57	7.76	0.0198	5.37	11.99	7.60	79.81
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	262.36	0.4804	130.35	7.44	0.0190	5.14	11.92	7.50	79.59
Maximum (all)	266.77	0.4897	134.08	8.12	0.0207	5.64	12.04	7.67	80.34
Average (valid values only)	264.47	0.4841	131.57	7.76	0.0198	5.37	11.99	7.60	79.81
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

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CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 3:19 PM thru 5/4/2015 3:39 PM

Timestamp	(Boiler 2) 60-NOx ppm 1-Min	(Boiler 2) NOx lb/mmBtu 1-Min	(Boiler 2) NOx lb/hr 1-Min	(Boiler 2) SO2 ppm 1-Min	(Boiler 2) SO2 lb/mmBtu 1-Min	(Boiler 2) SO2 lb/hr 1-Min	(Boiler 2) CO2% 1-Min	(Boiler 2) O2% 1-Min	(Boiler 2) Stack Flow kscf/min 1-Min
5/4 15:19	266.14	0.4903	131.98	8.09	0.0207	5.57	11.96	7.68	79.25
5/4 15:20	265.45	0.4879	131.32	8.12	0.0208	5.60	11.95	7.65	79.31
5/4 15:21	263.91	0.4825	129.94	7.90	0.0201	5.41	11.95	7.58	79.35
5/4 15:22	262.07	0.4795	129.26	7.95	0.0202	5.45	11.95	7.59	79.43
5/4 15:23	265.13	0.4858	131.01	7.87	0.0201	5.42	11.95	7.61	79.46
5/4 15:24	266.10	0.4894	131.69	7.56	0.0193	5.19	11.95	7.66	79.29
5/4 15:25	267.56	0.4914	131.96	7.76	0.0198	5.32	11.94	7.64	79.19
5/4 15:26	267.80	0.4922	132.12	7.90	0.0202	5.42	11.94	7.65	79.16
5/4 15:27	267.83	0.4893	131.39	7.90	0.0201	5.40	11.95	7.57	79.12
5/4 15:28	268.30	0.4913	132.20	8.26	0.0210	5.65	11.96	7.60	79.22
5/4 15:29	266.58	0.4892	131.70	8.00	0.0204	5.49	11.96	7.63	79.26
5/4 15:30	265.43	0.4864	130.93	7.81	0.0199	5.36	11.96	7.61	79.25
5/4 15:31	263.28	0.4835	130.48	7.89	0.0202	5.45	11.96	7.64	79.45
5/4 15:32	263.73	0.4814	130.30	8.01	0.0203	5.49	11.97	7.56	79.62
5/4 15:33	264.07	0.4861	131.39	7.96	0.0204	5.51	11.96	7.67	79.58
5/4 15:34	265.25	0.4871	131.43	7.63	0.0195	5.26	11.94	7.64	79.57
5/4 15:35	266.32	0.4910	132.86	7.65	0.0196	5.30	11.94	7.69	79.80
5/4 15:36	265.50	0.4902	132.69	7.84	0.0201	5.44	11.93	7.71	79.89
5/4 15:37	265.83	0.4893	132.13	7.96	0.0204	5.51	11.93	7.67	79.70
5/4 15:38	264.60	0.4882	131.40	8.02	0.0206	5.54	11.93	7.70	79.44
5/4 15:39	265.06	0.4897	131.64	7.99	0.0205	5.51	11.93	7.72	79.34
Average (all)	265.52	0.4877	131.42	7.91	0.0202	5.44	11.95	7.64	79.41
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	262.07	0.4795	129.26	7.56	0.0193	5.19	11.93	7.56	79.12
Maximum (all)	268.30	0.4922	132.86	8.26	0.0210	5.65	11.97	7.72	79.89
Average (valid values only)	265.52	0.4877	131.42	7.91	0.0202	5.44	11.95	7.64	79.41
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

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CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:05 PM thru 4/28/2015 12:25 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 Crnt Hr	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min
4/28 12:05	7.72	8.17	0.0099	2.22	0.00	0.00	0.0000	0.00	9.82
4/28 12:06	7.73	8.18	0.0099	2.26	0.00	0.00	0.0000	0.00	9.81
4/28 12:07	7.76	8.21	0.0099	2.20	0.00	0.00	0.0000	0.00	9.83
4/28 12:08	7.88	8.31	0.0101	2.21	0.00	0.00	0.0000	0.00	9.86
4/28 12:09	7.79	8.24	0.0100	2.24	0.00	0.00	0.0000	0.00	9.84
4/28 12:10	7.81	8.25	0.0100	2.27	0.00	0.00	0.0000	0.00	9.85
4/28 12:11	7.87	8.30	0.0101	2.29	0.00	0.00	0.0000	0.00	9.87
4/28 12:12	7.86	8.29	0.0100	2.24	0.00	0.00	0.0000	0.00	9.87
4/28 12:13	8.02	8.43	0.0102	2.20	0.00	0.00	0.0000	0.00	9.91
4/28 12:14	7.94	8.37	0.0101	2.37	0.00	0.00	0.0000	0.00	9.89
4/28 12:15	7.73	8.18	0.0099	2.24	0.00	0.00	0.0000	0.00	9.83
4/28 12:16	7.53	8.00	0.0097	2.21	0.00	0.00	0.0000	0.00	9.80
4/28 12:17	7.49	7.97	0.0097	2.17	0.00	0.00	0.0000	0.00	9.79
4/28 12:18	7.66	8.11	0.0098	2.15	0.00	0.00	0.0000	0.00	9.85
4/28 12:19	7.71	8.15	0.0099	2.21	0.00	0.00	0.0000	0.00	9.86
4/28 12:20	7.80	8.22	0.0100	2.27	0.00	0.00	0.0000	0.00	9.90
4/28 12:21	7.73	8.16	0.0099	2.22	0.00	0.00	0.0000	0.00	9.87
4/28 12:22	7.70	8.14	0.0099	2.20	0.00	0.00	0.0000	0.00	9.87
4/28 12:23	7.77	8.19	0.0099	2.26	0.00	0.00	0.0000	0.00	9.90
4/28 12:24	7.66	8.10	0.0098	2.23	0.00	0.00	0.0000	0.00	9.86
4/28 12:25	7.73	8.16	0.0099	2.21	0.00	0.00	0.0000	0.00	9.89
Average (all)	7.76	8.20	0.0099	2.23	0.00	0.00	0.0000	0.00	9.86
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	7.49	7.97	0.0097	2.15	0.00	0.00	0.0000	0.00	9.79
Maximum (all)	8.02	8.43	0.0102	2.37	0.00	0.00	0.0000	0.00	9.91
Average (valid values only)	7.76	8.20	0.0099	2.23	0.00	0.00	0.0000	0.00	9.86
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:05 PM thru 4/28/2015 12:25 PM

Timestamp	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 12:05	3.98	3.36	2408.90
4/28 12:06	3.98	3.37	2449.08
4/28 12:07	3.98	3.36	2378.09
4/28 12:08	3.93	3.32	2349.12
4/28 12:09	3.97	3.35	2405.97
4/28 12:10	3.95	3.34	2436.71
4/28 12:11	3.93	3.32	2432.03
4/28 12:12	3.93	3.32	2391.30
4/28 12:13	3.87	3.27	2297.21
4/28 12:14	3.91	3.30	2496.81
4/28 12:15	3.99	3.36	2428.69
4/28 12:16	4.06	3.43	2461.47
4/28 12:17	4.07	3.45	2425.08
4/28 12:18	3.99	3.37	2349.30
4/28 12:19	3.96	3.34	2400.62
4/28 12:20	3.91	3.31	2437.69
4/28 12:21	3.95	3.34	2406.73
4/28 12:22	3.96	3.34	2392.93
4/28 12:23	3.92	3.31	2434.48
4/28 12:24	3.97	3.36	2439.19
4/28 12:25	3.94	3.33	2394.56
Average (all)	3.96	3.35	2410.28
Total (all)	--	--	--
Minimum (all)	3.87	3.27	2297.21
Maximum (all)	4.07	3.45	2496.81
Average (valid values only)	3.96	3.35	2410.28
Total (valid values only)	--	--	--
Count (valid values only)	21	21	21

#2

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:53 PM thru 4/28/2015 1:13 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 Crnt Hr	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min
4/28 12:53	7.86	8.30	0.0101	2.31	0.00	0.00	0.0000	0.00	9.90
4/28 12:54	7.86	8.30	0.0101	2.20	0.00	0.00	0.0000	0.00	9.92
4/28 12:55	7.84	8.28	0.0100	2.22	0.00	0.00	0.0000	0.00	9.90
4/28 12:56	7.83	8.28	0.0100	2.27	0.00	0.00	0.0000	0.00	9.90
4/28 12:57	7.85	8.30	0.0101	2.27	0.00	0.00	0.0000	0.00	9.91
4/28 12:58	7.80	8.26	0.0100	2.24	0.00	0.00	0.0000	0.00	9.89
4/28 12:59	7.79	8.25	0.0100	2.29	0.00	0.00	0.0000	0.00	9.90
4/28 13:00	7.89	8.33	0.0101	2.29	0.00	0.00	0.0000	0.00	9.94
4/28 13:01	7.75	8.20	0.0099	2.27	0.00	0.00	0.0000	0.00	9.90
4/28 13:02	7.71	8.16	0.0099	2.26	0.00	0.00	0.0000	0.00	9.90
4/28 13:03	7.83	8.27	0.0100	2.24	0.00	0.00	0.0000	0.00	9.93
4/28 13:04	7.73	8.18	0.0099	2.19	0.00	0.00	0.0000	0.00	9.90
4/28 13:05	7.76	8.19	0.0099	2.24	0.00	0.00	0.0000	0.00	9.93
4/28 13:06	7.75	8.19	0.0099	2.19	0.00	0.00	0.0000	0.00	9.93
4/28 13:07	7.76	8.20	0.0099	2.18	0.00	0.00	0.0000	0.00	9.94
4/28 13:08	7.75	8.19	0.0099	2.21	0.00	0.00	0.0000	0.00	9.94
4/28 13:09	7.82	8.25	0.0100	2.22	0.00	0.00	0.0000	0.00	9.97
4/28 13:10	7.85	8.28	0.0100	2.21	0.00	0.00	0.0000	0.00	9.98
4/28 13:11	7.90	8.33	0.0101	2.18	0.00	0.00	0.0000	0.00	9.97
4/28 13:12	7.73	8.19	0.0099	2.21	0.00	0.00	0.0000	0.00	9.94
4/28 13:13	7.62	8.09	0.0098	2.20	0.00	0.00	0.0000	0.00	9.90
Average (all)	7.79	8.24	0.0100	2.23	0.00	0.00	0.0000	0.00	9.92
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	7.62	8.09	0.0098	2.18	0.00	0.00	0.0000	0.00	9.89
Maximum (all)	7.90	8.33	0.0101	2.31	0.00	0.00	0.0000	0.00	9.98
Average (valid values only)	7.79	8.24	0.0100	2.23	0.00	0.00	0.0000	0.00	9.92
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:53 PM thru 4/28/2015 1:13 PM

Timestamp	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 12:53	3.94	3.33	2465.48
4/28 12:54	3.94	3.33	2339.98
4/28 12:55	3.96	3.34	2373.34
4/28 12:56	3.98	3.36	2429.25
4/28 12:57	3.98	3.36	2421.68
4/28 12:58	4.00	3.38	2406.95
4/28 12:59	3.99	3.37	2466.53
4/28 13:00	3.94	3.33	2430.82
4/28 13:01	3.98	3.36	2450.56
4/28 13:02	3.99	3.37	2454.68
4/28 13:03	3.95	3.33	2392.26
4/28 13:04	3.98	3.35	2378.34
4/28 13:05	3.95	3.33	2415.00
4/28 13:06	3.96	3.33	2370.80
4/28 13:07	3.96	3.34	2354.28
4/28 13:08	3.96	3.34	2387.97
4/28 13:09	3.93	3.31	2382.02
4/28 13:10	3.93	3.31	2361.59
4/28 13:11	3.92	3.30	2310.44
4/28 13:12	4.00	3.37	2400.13
4/28 13:13	4.05	3.42	2413.03
Average (all)	3.97	3.35	2400.24
Total (all)	--	--	--
Minimum (all)	3.92	3.30	2310.44
Maximum (all)	4.05	3.42	2466.53
Average (valid values only)	3.97	3.35	2400.24
Total (valid values only)	--	--	--
Count (valid values only)	21	21	21

Run 3

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 1:45 PM thru 4/28/2015 2:05 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 Crnt Hr	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min
4/28 13:45	7.61	8.08	0.0098	2.21	0.00	0.00	0.0000	0.00	9.95
4/28 13:46	7.46	7.94	0.0096	2.11	0.00	0.00	0.0000	0.00	9.92
4/28 13:47	7.62	8.08	0.0098	2.19	0.00	0.00	0.0000	0.00	9.96
4/28 13:48	7.82	8.26	0.0100	2.25	0.00	0.00	0.0000	0.00	10.01
4/28 13:49	7.91	8.34	0.0101	2.26	0.00	0.00	0.0000	0.00	10.02
4/28 13:50	7.86	8.30	0.0101	2.25	0.00	0.00	0.0000	0.00	10.01
4/28 13:51	7.84	8.27	0.0100	2.26	0.00	0.00	0.0000	0.00	10.02
4/28 13:52	7.80	8.25	0.0100	2.22	0.00	0.00	0.0000	0.00	10.01
4/28 13:53	7.71	8.16	0.0099	2.18	0.00	0.00	0.0000	0.00	9.99
4/28 13:54	7.90	8.31	0.0101	2.28	0.00	0.00	0.0000	0.00	10.05
4/28 13:55	7.74	8.18	0.0099	2.09	0.00	0.00	0.0000	0.00	10.02
4/28 13:56	7.72	8.16	0.0099	2.19	0.00	0.00	0.0000	0.00	10.01
4/28 13:57	7.63	8.09	0.0098	2.23	0.00	0.00	0.0000	0.00	9.98
4/28 13:58	7.76	8.19	0.0099	2.25	0.00	0.00	0.0000	0.00	10.02
4/28 13:59	7.85	8.27	0.0100	2.16	0.00	0.00	0.0000	0.00	10.05
4/28 14:00	7.80	8.23	0.0100	2.24	0.00	0.00	0.0000	0.00	10.04
4/28 14:01	7.68	8.13	0.0099	2.25	0.00	0.00	0.0000	0.00	10.00
4/28 14:02	7.43	7.92	0.0096	2.10	0.00	0.00	0.0000	0.00	9.92
4/28 14:03	7.68	8.13	0.0099	2.22	0.00	0.00	0.0000	0.00	9.99
4/28 14:04	7.77	8.21	0.0099	2.25	0.00	0.00	0.0000	0.00	10.01
4/28 14:05	7.78	8.23	0.0100	2.19	0.00	0.00	0.0000	0.00	10.01
Average (all)	7.73	8.18	0.0099	2.21	0.00	0.00	0.0000	0.00	10.00
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	7.43	7.92	0.0096	2.09	0.00	0.00	0.0000	0.00	9.92
Maximum (all)	7.91	8.34	0.0101	2.28	0.00	0.00	0.0000	0.00	10.05
Average (valid values only)	7.73	8.18	0.0099	2.21	0.00	0.00	0.0000	0.00	10.00
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 1:45 PM thru 4/28/2015 2:05 PM

Timestamp	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 13:45	4.04	3.42	2427.16
4/28 13:46	4.09	3.45	2369.16
4/28 13:47	4.02	3.40	2403.97
4/28 13:48	3.95	3.32	2411.72
4/28 13:49	3.92	3.31	2392.16
4/28 13:50	3.95	3.32	2396.84
4/28 13:51	3.94	3.33	2413.10
4/28 13:52	3.97	3.35	2386.07
4/28 13:53	3.99	3.36	2368.25
4/28 13:54	3.89	3.30	2416.97
4/28 13:55	3.96	3.34	2258.36
4/28 13:56	3.97	3.35	2372.73
4/28 13:57	4.01	3.38	2451.43
4/28 13:58	3.95	3.33	2429.30
4/28 13:59	3.91	3.29	2306.67
4/28 14:00	3.93	3.32	2404.60
4/28 14:01	3.99	3.37	2452.14
4/28 14:02	4.11	3.47	2366.81
4/28 14:03	4.00	3.38	2420.01
4/28 14:04	3.96	3.34	2420.65
4/28 14:05	3.97	3.34	2356.41
Average (all)	3.98	3.36	2391.64
Total (all)	--	--	--
Minimum (all)	3.89	3.29	2258.36
Maximum (all)	4.11	3.47	2452.14
Average (valid values only)	3.98	3.36	2391.64
Total (valid values only)	--	--	--
Count (valid values only)	21	21	21

#4

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 2:27 PM thru 4/28/2015 2:47 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 Crnt Hr	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min
4/28 14:27	7.87	8.30	0.0101	2.21	0.00	0.00	0.0000	0.00	9.99
4/28 14:28	7.78	8.22	0.0100	2.30	0.00	0.00	0.0000	0.00	9.95
4/28 14:29	7.78	8.22	0.0100	2.26	0.00	0.00	0.0000	0.00	9.95
4/28 14:30	7.67	8.12	0.0098	2.17	0.00	0.00	0.0000	0.00	9.92
4/28 14:31	7.59	8.05	0.0098	2.23	0.00	0.00	0.0000	0.00	9.91
4/28 14:32	7.45	7.93	0.0096	2.14	0.00	0.00	0.0000	0.00	9.87
4/28 14:33	7.61	8.06	0.0098	2.23	0.00	0.00	0.0000	0.00	9.92
4/28 14:34	7.77	8.21	0.0099	2.19	0.00	0.00	0.0000	0.00	9.95
4/28 14:35	7.86	8.28	0.0100	2.27	0.00	0.00	0.0000	0.00	9.97
4/28 14:36	7.88	8.29	0.0100	2.23	0.00	0.00	0.0000	0.00	9.98
4/28 14:37	7.78	8.21	0.0099	2.25	0.00	0.00	0.0000	0.00	9.94
4/28 14:38	7.72	8.16	0.0099	2.30	0.00	0.00	0.0000	0.00	9.94
4/28 14:39	7.63	8.09	0.0098	2.27	0.00	0.00	0.0000	0.00	9.91
4/28 14:40	7.43	7.91	0.0096	2.20	0.00	0.00	0.0000	0.00	9.84
4/28 14:41	7.53	7.99	0.0097	2.27	0.00	0.00	0.0000	0.00	9.89
4/28 14:42	7.64	8.09	0.0098	2.15	0.00	0.00	0.0000	0.00	9.91
4/28 14:43	7.86	8.27	0.0100	2.15	0.00	0.00	0.0000	0.00	9.98
4/28 14:44	7.87	8.27	0.0100	2.31	0.00	0.00	0.0000	0.00	9.97
4/28 14:45	7.81	8.22	0.0100	2.30	0.00	0.00	0.0000	0.00	9.96
4/28 14:46	7.66	8.11	0.0098	2.26	0.00	0.00	0.0000	0.00	9.91
4/28 14:47	7.61	8.07	0.0098	2.17	0.00	0.00	0.0000	0.00	9.90
Average (all)	7.70	8.15	0.0099	2.23	0.00	0.00	0.0000	0.00	9.93
Total (all)	--	--	--	--	--	--	--	--	--
Minimum (all)	7.43	7.91	0.0096	2.14	0.00	0.00	0.0000	0.00	9.84
Maximum (all)	7.88	8.30	0.0101	2.31	0.00	0.00	0.0000	0.00	9.99
Average (valid values only)	7.70	8.15	0.0099	2.23	0.00	0.00	0.0000	0.00	9.93
Total (valid values only)	--	--	--	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 2:27 PM thru 4/28/2015 2:47 PM

Timestamp	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 14:27	3.92	3.30	2349.79
4/28 14:28	3.95	3.33	2477.67
4/28 14:29	3.95	3.33	2432.51
4/28 14:30	4.00	3.37	2366.88
4/28 14:31	4.02	3.39	2460.06
4/28 14:32	4.08	3.44	2400.97
4/28 14:33	4.00	3.37	2452.12
4/28 14:34	3.95	3.33	2359.61
4/28 14:35	3.90	3.29	2420.52
4/28 14:36	3.88	3.28	2371.69
4/28 14:37	3.94	3.31	2425.28
4/28 14:38	3.96	3.33	2491.60
4/28 14:39	4.01	3.38	2492.15
4/28 14:40	4.09	3.45	2478.81
4/28 14:41	4.04	3.40	2524.85
4/28 14:42	3.99	3.36	2356.20
4/28 14:43	3.88	3.27	2290.36
4/28 14:44	3.87	3.27	2459.39
4/28 14:45	3.90	3.29	2467.48
4/28 14:46	3.99	3.35	2470.28
4/28 14:47	4.01	3.38	2386.84
Average (all)	3.97	3.34	2425.48
Total (all)	--	--	--
Minimum (all)	3.87	3.27	2290.36
Maximum (all)	4.09	3.45	2524.85
Average (valid values only)	3.97	3.34	2425.48
Total (valid values only)	--	--	--
Count (valid values only)	21	21	21

#5

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 3:19 PM thru 4/28/2015 3:39 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 1 Min
4/28 15:19	7.64	8.09	0.0098	2.21	0.00	0.00
4/28 15:20	7.59	8.05	0.0098	2.18	0.00	0.00
4/28 15:21	7.71	8.15	0.0099	2.24	0.00	0.00
4/28 15:22	7.74	8.17	0.0099	2.23	0.00	0.00
4/28 15:23	7.72	8.16	0.0099	2.17	0.00	0.00
4/28 15:24	7.63	8.08	0.0098	2.23	0.00	0.00
4/28 15:25	7.62	8.07	0.0098	2.19	0.00	0.00
4/28 15:26	7.65	8.10	0.0098	2.21	0.00	0.00
4/28 15:27	7.67	8.11	0.0098	2.14	0.00	0.00
4/28 15:28	7.72	8.16	0.0099	2.21	0.00	0.00
4/28 15:29	7.68	8.12	0.0098	2.08	0.00	0.00
4/28 15:30	7.69	8.13	0.0098	2.22	0.00	0.00
4/28 15:31	7.65	8.09	0.0098	2.23	0.00	0.00
4/28 15:32	7.61	8.05	0.0098	2.24	0.00	0.00
4/28 15:33	7.62	8.06	0.0098	2.20	0.00	0.00
4/28 15:34	7.64	8.07	0.0098	2.20	0.00	0.00
4/28 15:35	7.62	8.06	0.0098	2.17	0.00	0.00
4/28 15:36	7.59	8.03	0.0097	2.23	0.00	0.00
4/28 15:37	7.58	8.03	0.0097	2.26	0.00	0.00
4/28 15:38	7.60	8.04	0.0097	2.23	0.00	0.00
4/28 15:39	7.60	8.05	0.0098	2.16	0.00	0.00
Average (all)	7.65	8.09	0.0098	2.20	0.00	0.00
Total (all)	--	--	--	--	--	--
Minimum (all)	7.58	8.03	0.0097	2.08	0.00	0.00
Maximum (all)	7.74	8.17	0.0099	2.26	0.00	0.00
Average (valid values only)	7.65	8.09	0.0098	2.20	0.00	0.00
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 3:19 PM thru 4/28/2015 3:39 PM

Timestamp	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 15:19	0.0000	0.00	9.92	3.99	3.35	2424.37
4/28 15:20	0.0000	0.00	9.91	4.02	3.36	2401.05
4/28 15:21	0.0000	0.00	9.95	3.96	3.31	2436.02
4/28 15:22	0.0000	0.00	9.96	3.95	3.31	2414.29
4/28 15:23	0.0000	0.00	9.96	3.96	3.32	2349.54
4/28 15:24	0.0000	0.00	9.93	4.00	3.36	2442.69
4/28 15:25	0.0000	0.00	9.94	4.00	3.36	2407.31
4/28 15:26	0.0000	0.00	9.94	3.99	3.35	2418.74
4/28 15:27	0.0000	0.00	9.95	3.98	3.35	2334.80
4/28 15:28	0.0000	0.00	9.97	3.96	3.33	2399.16
4/28 15:29	0.0000	0.00	9.95	3.98	3.33	2270.79
4/28 15:30	0.0000	0.00	9.96	3.96	3.33	2417.15
4/28 15:31	0.0000	0.00	9.96	3.97	3.32	2436.27
4/28 15:32	0.0000	0.00	9.95	3.98	3.34	2461.70
4/28 15:33	0.0000	0.00	9.96	3.97	3.34	2420.67
4/28 15:34	0.0000	0.00	9.97	3.96	3.33	2406.76
4/28 15:35	0.0000	0.00	9.96	3.98	3.34	2381.18
4/28 15:36	0.0000	0.00	9.95	3.98	3.34	2459.08
4/28 15:37	0.0000	0.00	9.94	4.00	3.36	2495.88
4/28 15:38	0.0000	0.00	9.94	3.99	3.35	2452.54
4/28 15:39	0.0000	0.00	9.93	4.00	3.36	2383.30
Average (all)	0.0000	0.00	9.95	3.98	3.34	2410.16
Total (all)	--	--	--	--	--	--
Minimum (all)	0.0000	0.00	9.91	3.95	3.31	2270.79
Maximum (all)	0.0000	0.00	9.97	4.02	3.36	2495.88
Average (valid values only)	0.0000	0.00	9.95	3.98	3.34	2410.16
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

#6

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:04 PM thru 4/28/2015 4:24 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 1 Min
4/28 16:04	7.76	8.20	0.0099	2.28	0.00	0.00
4/28 16:05	7.77	8.21	0.0099	2.26	0.00	0.00
4/28 16:06	7.76	8.20	0.0099	2.27	0.00	0.00
4/28 16:07	7.74	8.18	0.0099	2.30	0.00	0.00
4/28 16:08	7.74	8.18	0.0099	2.24	0.00	0.00
4/28 16:09	7.69	8.14	0.0099	2.26	0.00	0.00
4/28 16:10	7.68	8.12	0.0098	2.26	0.00	0.00
4/28 16:11	7.69	8.13	0.0099	2.18	0.00	0.00
4/28 16:12	7.68	8.12	0.0098	2.21	0.00	0.00
4/28 16:13	7.66	8.10	0.0098	2.25	0.00	0.00
4/28 16:14	7.67	8.11	0.0098	2.19	0.00	0.00
4/28 16:15	7.67	8.11	0.0098	2.23	0.00	0.00
4/28 16:16	7.70	8.13	0.0099	2.17	0.00	0.00
4/28 16:17	7.71	8.14	0.0099	2.28	0.00	0.00
4/28 16:18	7.69	8.12	0.0098	2.22	0.00	0.00
4/28 16:19	7.60	8.04	0.0097	2.21	0.00	0.00
4/28 16:20	7.56	8.01	0.0097	2.23	0.00	0.00
4/28 16:21	7.60	8.05	0.0098	2.20	0.00	0.00
4/28 16:22	7.64	8.08	0.0098	2.27	0.00	0.00
4/28 16:23	7.66	8.10	0.0098	2.10	0.00	0.00
4/28 16:24	7.74	8.16	0.0099	2.19	0.00	0.00
Average (all)	7.69	8.13	0.0098	2.23	0.00	0.00
Total (all)	--	--	--	--	--	--
Minimum (all)	7.56	8.01	0.0097	2.10	0.00	0.00
Maximum (all)	7.77	8.21	0.0099	2.30	0.00	0.00
Average (valid values only)	7.69	8.13	0.0098	2.23	0.00	0.00
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:04 PM thru 4/28/2015 4:24 PM

Timestamp	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 16:04	0.0000	0.00	9.91	3.96	3.34	2459.77
4/28 16:05	0.0000	0.00	9.92	3.96	3.33	2433.04
4/28 16:06	0.0000	0.00	9.92	3.96	3.33	2450.61
4/28 16:07	0.0000	0.00	9.90	3.97	3.34	2488.72
4/28 16:08	0.0000	0.00	9.91	3.96	3.33	2420.51
4/28 16:09	0.0000	0.00	9.90	3.98	3.34	2462.62
4/28 16:10	0.0000	0.00	9.90	3.98	3.35	2465.02
4/28 16:11	0.0000	0.00	9.91	3.97	3.33	2369.11
4/28 16:12	0.0000	0.00	9.91	3.97	3.33	2412.57
4/28 16:13	0.0000	0.00	9.90	3.97	3.33	2460.22
4/28 16:14	0.0000	0.00	9.91	3.97	3.34	2386.84
4/28 16:15	0.0000	0.00	9.89	3.98	3.34	2430.91
4/28 16:16	0.0000	0.00	9.91	3.95	3.32	2363.80
4/28 16:17	0.0000	0.00	9.91	3.95	3.32	2474.27
4/28 16:18	0.0000	0.00	9.90	3.95	3.33	2421.82
4/28 16:19	0.0000	0.00	9.87	3.99	3.36	2439.31
4/28 16:20	0.0000	0.00	9.85	4.01	3.38	2466.68
4/28 16:21	0.0000	0.00	9.87	4.00	3.36	2423.54
4/28 16:22	0.0000	0.00	9.88	3.98	3.35	2490.69
4/28 16:23	0.0000	0.00	9.89	3.97	3.34	2301.29
4/28 16:24	0.0000	0.00	9.91	3.93	3.31	2369.18
Average (all)	0.0000	0.00	9.90	3.97	3.34	2428.12
Total (all)	--	--	--	--	--	--
Minimum (all)	0.0000	0.00	9.85	3.93	3.31	2301.29
Maximum (all)	0.0000	0.00	9.92	4.01	3.38	2490.69
Average (valid values only)	0.0000	0.00	9.90	3.97	3.34	2428.12
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

#7

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:53 PM thru 4/28/2015 5:13 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 1 Min
4/28 16:53	7.73	8.16	0.0099	2.17	0.00	0.00
4/28 16:54	7.76	8.19	0.0099	2.17	0.00	0.00
4/28 16:55	7.76	8.19	0.0099	2.24	0.00	0.00
4/28 16:56	7.77	8.21	0.0099	2.21	0.00	0.00
4/28 16:57	7.75	8.18	0.0099	2.20	0.00	0.00
4/28 16:58	7.68	8.12	0.0098	2.19	0.00	0.00
4/28 16:59	7.64	8.09	0.0098	2.32	0.00	0.00
4/28 17:00	7.65	8.10	0.0098	2.16	0.00	0.00
4/28 17:01	7.67	8.12	0.0098	2.20	0.00	0.00
4/28 17:02	7.67	8.11	0.0098	2.20	0.00	0.00
4/28 17:03	7.75	8.18	0.0099	2.15	0.00	0.00
4/28 17:04	7.77	8.20	0.0099	2.32	0.00	0.00
4/28 17:05	7.80	8.22	0.0100	2.26	0.00	0.00
4/28 17:06	7.73	8.16	0.0099	2.27	0.00	0.00
4/28 17:07	7.68	8.12	0.0098	2.23	0.00	0.00
4/28 17:08	7.52	7.98	0.0097	2.16	0.00	0.00
4/28 17:09	7.51	7.98	0.0097	2.16	0.00	0.00
4/28 17:10	7.65	8.10	0.0098	2.25	0.00	0.00
4/28 17:11	7.69	8.13	0.0099	2.17	0.00	0.00
4/28 17:12	7.77	8.20	0.0099	2.28	0.00	0.00
4/28 17:13	7.83	8.25	0.0100	2.16	0.00	0.00
Average (all)	7.70	8.14	0.0099	2.21	0.00	0.00
Total (all)	--	--	--	--	--	--
Minimum (all)	7.51	7.98	0.0097	2.15	0.00	0.00
Maximum (all)	7.83	8.25	0.0100	2.32	0.00	0.00
Average (valid values only)	7.70	8.14	0.0099	2.21	0.00	0.00
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:53 PM thru 4/28/2015 5:13 PM

Timestamp	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 16:53	0.0000	0.00	9.88	3.95	3.31	2349.15
4/28 16:54	0.0000	0.00	9.89	3.93	3.31	2337.51
4/28 16:55	0.0000	0.00	9.89	3.93	3.30	2422.45
4/28 16:56	0.0000	0.00	9.88	3.95	3.32	2379.00
4/28 16:57	0.0000	0.00	9.87	3.95	3.32	2373.73
4/28 16:58	0.0000	0.00	9.85	3.98	3.34	2387.61
4/28 16:59	0.0000	0.00	9.84	3.99	3.36	2547.07
4/28 17:00	0.0000	0.00	9.84	4.00	3.36	2362.49
4/28 17:01	0.0000	0.00	9.85	3.99	3.35	2402.02
4/28 17:02	0.0000	0.00	9.86	3.98	3.35	2400.56
4/28 17:03	0.0000	0.00	9.88	3.95	3.32	2324.95
4/28 17:04	0.0000	0.00	9.89	3.93	3.30	2501.73
4/28 17:05	0.0000	0.00	9.90	3.92	3.30	2423.48
4/28 17:06	0.0000	0.00	9.88	3.95	3.31	2454.49
4/28 17:07	0.0000	0.00	9.86	3.96	3.34	2430.15
4/28 17:08	0.0000	0.00	9.81	4.04	3.40	2401.91
4/28 17:09	0.0000	0.00	9.82	4.05	3.41	2408.74
4/28 17:10	0.0000	0.00	9.84	3.99	3.36	2459.22
4/28 17:11	0.0000	0.00	9.86	3.97	3.34	2360.99
4/28 17:12	0.0000	0.00	9.87	3.93	3.31	2452.50
4/28 17:13	0.0000	0.00	9.89	3.91	3.29	2314.30
Average (all)	0.0000	0.00	9.86	3.96	3.33	2404.48
Total (all)	--	--	--	--	--	--
Minimum (all)	0.0000	0.00	9.81	3.91	3.29	2314.30
Maximum (all)	0.0000	0.00	9.90	4.05	3.41	2547.07
Average (valid values only)	0.0000	0.00	9.86	3.96	3.33	2404.48
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

#8

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 5:33 PM thru 4/28/2015 5:53 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 1 Min
4/28 17:33	7.80	8.22	0.0100	2.27	0.00	0.00
4/28 17:34	7.76	8.19	0.0099	2.27	0.00	0.00
4/28 17:35	7.78	8.20	0.0099	2.27	0.00	0.00
4/28 17:36	7.66	8.10	0.0098	2.21	0.00	0.00
4/28 17:37	7.65	8.09	0.0098	2.22	0.00	0.00
4/28 17:38	7.67	8.10	0.0098	2.18	0.00	0.00
4/28 17:39	7.71	8.14	0.0099	2.19	0.00	0.00
4/28 17:40	7.77	8.19	0.0099	2.20	0.00	0.00
4/28 17:41	7.70	8.13	0.0099	2.12	0.00	0.00
4/28 17:42	7.46	7.93	0.0096	2.17	0.00	0.00
4/28 17:43	7.37	7.86	0.0095	2.13	0.00	0.00
4/28 17:44	7.57	8.03	0.0097	2.19	0.00	0.00
4/28 17:45	7.78	8.20	0.0099	2.22	0.00	0.00
4/28 17:46	8.00	8.39	0.0102	2.39	0.00	0.00
4/28 17:47	8.00	8.39	0.0102	2.26	0.00	0.00
4/28 17:48	7.86	8.27	0.0100	2.16	0.00	0.00
4/28 17:49	7.69	8.13	0.0099	2.27	0.00	0.00
4/28 17:50	7.56	8.02	0.0097	2.14	0.00	0.00
4/28 17:51	7.43	7.92	0.0096	2.17	0.00	0.00
4/28 17:52	7.48	7.96	0.0096	2.17	0.00	0.00
4/28 17:53	7.53	8.00	0.0097	2.22	0.00	0.00
Average (all)	7.68	8.12	0.0098	2.21	0.00	0.00
Total (all)	--	--	--	--	--	--
Minimum (all)	7.37	7.86	0.0095	2.12	0.00	0.00
Maximum (all)	8.00	8.39	0.0102	2.39	0.00	0.00
Average (valid values only)	7.68	8.12	0.0098	2.21	0.00	0.00
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 5:33 PM thru 4/28/2015 5:53 PM

Timestamp	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 17:33	0.0000	0.00	9.88	3.92	3.30	2436.50
4/28 17:34	0.0000	0.00	9.86	3.94	3.31	2453.84
4/28 17:35	0.0000	0.00	9.88	3.92	3.30	2446.81
4/28 17:36	0.0000	0.00	9.83	3.98	3.35	2416.53
4/28 17:37	0.0000	0.00	9.84	3.97	3.34	2432.39
4/28 17:38	0.0000	0.00	9.84	3.96	3.33	2385.40
4/28 17:39	0.0000	0.00	9.86	3.94	3.31	2382.98
4/28 17:40	0.0000	0.00	9.87	3.91	3.29	2373.55
4/28 17:41	0.0000	0.00	9.85	3.95	3.31	2302.03
4/28 17:42	0.0000	0.00	9.78	4.06	3.42	2435.11
4/28 17:43	0.0000	0.00	9.75	4.11	3.45	2421.43
4/28 17:44	0.0000	0.00	9.81	4.02	3.37	2423.57
4/28 17:45	0.0000	0.00	9.86	3.92	3.29	2393.57
4/28 17:46	0.0000	0.00	9.92	3.83	3.23	2500.07
4/28 17:47	0.0000	0.00	9.90	3.84	3.22	2371.08
4/28 17:48	0.0000	0.00	9.87	3.89	3.27	2306.97
4/28 17:49	0.0000	0.00	9.81	3.97	3.34	2471.57
4/28 17:50	0.0000	0.00	9.78	4.03	3.40	2369.42
4/28 17:51	0.0000	0.00	9.73	4.10	3.45	2448.93
4/28 17:52	0.0000	0.00	9.77	4.07	3.42	2432.83
4/28 17:53	0.0000	0.00	9.77	4.05	3.40	2465.35
Average (all)	0.0000	0.00	9.83	3.97	3.34	2412.85
Total (all)	--	--	--	--	--	--
Minimum (all)	0.0000	0.00	9.73	3.83	3.22	2302.03
Maximum (all)	0.0000	0.00	9.92	4.11	3.45	2500.07
Average (valid values only)	0.0000	0.00	9.83	3.97	3.34	2412.85
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

#9

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 6:15 PM thru 4/28/2015 6:35 PM

Timestamp	NOx ppm 1-Min	NOx ppm @3% O2 1-Min	NOx lb/mmBtu 1-Min	NOx lb/hr (Stack Flow) 1-Min Avg	CO ppm 1-Min	CO ppm @3% O2 1 Min
4/28 18:15	7.76	8.19	0.0099	2.35	0.00	0.00
4/28 18:16	7.78	8.21	0.0099	2.16	0.00	0.00
4/28 18:17	7.76	8.19	0.0099	2.19	0.00	0.00
4/28 18:18	7.74	8.18	0.0099	2.23	0.00	0.00
4/28 18:19	7.66	8.10	0.0098	2.19	0.00	0.00
4/28 18:20	7.60	8.06	0.0098	2.23	0.00	0.00
4/28 18:21	7.69	8.14	0.0099	2.20	0.00	0.00
4/28 18:22	7.73	8.17	0.0099	2.22	0.00	0.00
4/28 18:23	7.76	8.20	0.0099	2.24	0.00	0.00
4/28 18:24	7.89	8.30	0.0101	2.25	0.00	0.00
4/28 18:25	7.98	8.38	0.0102	2.35	0.00	0.00
4/28 18:26	7.64	8.10	0.0098	2.29	0.00	0.00
4/28 18:27	7.39	7.89	0.0096	2.10	0.00	0.00
4/28 18:28	7.51	7.98	0.0097	2.20	0.00	0.00
4/28 18:29	7.62	8.08	0.0098	2.15	0.00	0.00
4/28 18:30	7.74	8.18	0.0099	2.19	0.00	0.00
4/28 18:31	7.84	8.26	0.0100	2.19	0.00	0.00
4/28 18:32	7.87	8.28	0.0100	2.30	0.00	0.00
4/28 18:33	7.84	8.25	0.0100	2.37	0.00	0.00
4/28 18:34	7.63	8.07	0.0098	2.23	0.00	0.00
4/28 18:35	7.53	7.99	0.0097	2.13	0.00	0.00
Average (all)	7.71	8.15	0.0099	2.23	0.00	0.00
Total (all)	--	--	--	--	--	--
Minimum (all)	7.39	7.89	0.0096	2.10	0.00	0.00
Maximum (all)	7.98	8.38	0.0102	2.37	0.00	0.00
Average (valid values only)	7.71	8.15	0.0099	2.23	0.00	0.00
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 6:15 PM thru 4/28/2015 6:35 PM

Timestamp	CO lb/mmBtu 1-Min	CO lb/hr (Stack Flow) 1-Min Avg	CO2 % 1-Min	O2% Dry 1-Min	O2% Wet 1-Min	Stack Flow kscf/hr (Dry) 1-Min
4/28 18:15	0.0000	0.00	9.81	3.94	3.31	2537.51
4/28 18:16	0.0000	0.00	9.81	3.94	3.32	2321.71
4/28 18:17	0.0000	0.00	9.81	3.94	3.31	2366.73
4/28 18:18	0.0000	0.00	9.80	3.96	3.33	2412.11
4/28 18:19	0.0000	0.00	9.78	3.98	3.35	2391.57
4/28 18:20	0.0000	0.00	9.76	4.02	3.38	2459.29
4/28 18:21	0.0000	0.00	9.79	3.98	3.35	2396.66
4/28 18:22	0.0000	0.00	9.80	3.96	3.33	2409.29
4/28 18:23	0.0000	0.00	9.81	3.96	3.32	2412.63
4/28 18:24	0.0000	0.00	9.85	3.89	3.27	2386.50
4/28 18:25	0.0000	0.00	9.86	3.86	3.25	2470.69
4/28 18:26	0.0000	0.00	9.77	4.01	3.38	2512.12
4/28 18:27	0.0000	0.00	9.70	4.13	3.47	2381.91
4/28 18:28	0.0000	0.00	9.74	4.06	3.42	2448.44
4/28 18:29	0.0000	0.00	9.76	4.02	3.37	2368.44
4/28 18:30	0.0000	0.00	9.80	3.96	3.32	2366.46
4/28 18:31	0.0000	0.00	9.84	3.90	3.27	2344.22
4/28 18:32	0.0000	0.00	9.84	3.88	3.26	2453.20
4/28 18:33	0.0000	0.00	9.85	3.88	3.27	2537.32
4/28 18:34	0.0000	0.00	9.79	3.98	3.35	2443.10
4/28 18:35	0.0000	0.00	9.76	4.03	3.38	2366.09
Average (all)	0.0000	0.00	9.80	3.97	3.33	2418.38
Total (all)	--	--	--	--	--	--
Minimum (all)	0.0000	0.00	9.70	3.86	3.25	2321.71
Maximum (all)	0.0000	0.00	9.86	4.13	3.47	2537.51
Average (valid values only)	0.0000	0.00	9.80	3.97	3.33	2418.38
Total (valid values only)	--	--	--	--	--	--
Count (valid values only)	21	21	21	21	21	21

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 6:14 PM thru 4/28/2015 6:35 PM

Timestamp	CO2 % 1-Min
4/28 18:14	9.82
4/28 18:15	9.81
4/28 18:16	9.81
4/28 18:17	9.81
4/28 18:18	9.80
4/28 18:19	9.78
4/28 18:20	9.76
4/28 18:21	9.79
4/28 18:22	9.80
4/28 18:23	9.81
4/28 18:24	9.85
4/28 18:25	9.86
4/28 18:26	9.77
4/28 18:27	9.70
4/28 18:28	9.74
4/28 18:29	9.76
4/28 18:30	9.80
4/28 18:31	9.84
4/28 18:32	9.84
4/28 18:33	9.85
4/28 18:34	9.79
4/28 18:35	9.76
Average (all)	9.80
Total (all)	--
Minimum (all)	9.70
Maximum (all)	9.86
Average (valid values only)	9.80
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:04 PM thru 4/28/2015 12:25 PM

Timestamp	CO2 % 1-Min
4/28 12:04	9.79
4/28 12:05	9.82
4/28 12:06	9.81
4/28 12:07	9.83
4/28 12:08	9.86
4/28 12:09	9.84
4/28 12:10	9.85
4/28 12:11	9.87
4/28 12:12	9.87
4/28 12:13	9.91
4/28 12:14	9.89
4/28 12:15	9.83
4/28 12:16	9.80
4/28 12:17	9.79
4/28 12:18	9.85
4/28 12:19	9.86
4/28 12:20	9.90
4/28 12:21	9.87
4/28 12:22	9.87
4/28 12:23	9.90
4/28 12:24	9.86
4/28 12:25	9.89
Average (all)	9.85
Total (all)	--
Minimum (all)	9.79
Maximum (all)	9.91
Average (valid values only)	9.85
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 12:52 PM thru 4/28/2015 1:13 PM

Timestamp	CO2 % 1-Min
4/28 12:52	9.91
4/28 12:53	9.90
4/28 12:54	9.92
4/28 12:55	9.90
4/28 12:56	9.90
4/28 12:57	9.91
4/28 12:58	9.89
4/28 12:59	9.90
4/28 13:00	9.94
4/28 13:01	9.90
4/28 13:02	9.90
4/28 13:03	9.93
4/28 13:04	9.90
4/28 13:05	9.93
4/28 13:06	9.93
4/28 13:07	9.94
4/28 13:08	9.94
4/28 13:09	9.97
4/28 13:10	9.98
4/28 13:11	9.97
4/28 13:12	9.94
4/28 13:13	9.90
Average (all)	9.92
Total (all)	--
Minimum (all)	9.89
Maximum (all)	9.98
Average (valid values only)	9.92
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 1:44 PM thru 4/28/2015 2:05 PM

Timestamp	CO2 % 1-Min
4/28 13:44	10.02
4/28 13:45	9.95
4/28 13:46	9.92
4/28 13:47	9.96
4/28 13:48	10.01
4/28 13:49	10.02
4/28 13:50	10.01
4/28 13:51	10.02
4/28 13:52	10.01
4/28 13:53	9.99
4/28 13:54	10.05
4/28 13:55	10.02
4/28 13:56	10.01
4/28 13:57	9.98
4/28 13:58	10.02
4/28 13:59	10.05
4/28 14:00	10.04
4/28 14:01	10.00
4/28 14:02	9.92
4/28 14:03	9.99
4/28 14:04	10.01
4/28 14:05	10.01
Average (all)	10.00
Total (all)	--
Minimum (all)	9.92
Maximum (all)	10.05
Average (valid values only)	10.00
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 2:26 PM thru 4/28/2015 2:47 PM

Timestamp	CO2 % 1-Min
4/28 14:26	9.95
4/28 14:27	9.99
4/28 14:28	9.95
4/28 14:29	9.95
4/28 14:30	9.92
4/28 14:31	9.91
4/28 14:32	9.87
4/28 14:33	9.92
4/28 14:34	9.95
4/28 14:35	9.97
4/28 14:36	9.98
4/28 14:37	9.94
4/28 14:38	9.94
4/28 14:39	9.91
4/28 14:40	9.84
4/28 14:41	9.89
4/28 14:42	9.91
4/28 14:43	9.98
4/28 14:44	9.97
4/28 14:45	9.96
4/28 14:46	9.91
4/28 14:47	9.90
Average (all)	9.93
Total (all)	--
Minimum (all)	9.84
Maximum (all)	9.99
Average (valid values only)	9.93
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 3:18 PM thru 4/28/2015 3:39 PM

Timestamp	CO2 % 1-Min
4/28 15:18	9.92
4/28 15:19	9.92
4/28 15:20	9.91
4/28 15:21	9.95
4/28 15:22	9.96
4/28 15:23	9.96
4/28 15:24	9.93
4/28 15:25	9.94
4/28 15:26	9.94
4/28 15:27	9.95
4/28 15:28	9.97
4/28 15:29	9.95
4/28 15:30	9.96
4/28 15:31	9.96
4/28 15:32	9.95
4/28 15:33	9.96
4/28 15:34	9.97
4/28 15:35	9.96
4/28 15:36	9.95
4/28 15:37	9.94
4/28 15:38	9.94
4/28 15:39	9.93
Average (all)	9.95
Total (all)	--
Minimum (all)	9.91
Maximum (all)	9.97
Average (valid values only)	9.95
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:03 PM thru 4/28/2015 4:24 PM

Timestamp	CO2 % 1-Min
4/28 16:03	9.93
4/28 16:04	9.91
4/28 16:05	9.92
4/28 16:06	9.92
4/28 16:07	9.90
4/28 16:08	9.91
4/28 16:09	9.90
4/28 16:10	9.90
4/28 16:11	9.91
4/28 16:12	9.91
4/28 16:13	9.90
4/28 16:14	9.91
4/28 16:15	9.89
4/28 16:16	9.91
4/28 16:17	9.91
4/28 16:18	9.90
4/28 16:19	9.87
4/28 16:20	9.85
4/28 16:21	9.87
4/28 16:22	9.88
4/28 16:23	9.89
4/28 16:24	9.91
Average (all)	9.90
Total (all)	--
Minimum (all)	9.85
Maximum (all)	9.93
Average (valid values only)	9.90
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 4:52 PM thru 4/28/2015 5:13 PM

Timestamp	CO2 % 1-Min
4/28 16:52	9.87
4/28 16:53	9.88
4/28 16:54	9.89
4/28 16:55	9.89
4/28 16:56	9.88
4/28 16:57	9.87
4/28 16:58	9.85
4/28 16:59	9.84
4/28 17:00	9.84
4/28 17:01	9.85
4/28 17:02	9.86
4/28 17:03	9.88
4/28 17:04	9.89
4/28 17:05	9.90
4/28 17:06	9.88
4/28 17:07	9.86
4/28 17:08	9.81
4/28 17:09	9.82
4/28 17:10	9.84
4/28 17:11	9.86
4/28 17:12	9.87
4/28 17:13	9.89
Average (all)	9.86
Total (all)	--
Minimum (all)	9.81
Maximum (all)	9.90
Average (valid values only)	9.86
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemicals

Data for 4/28/2015 5:32 PM thru 4/28/2015 5:53 PM

Timestamp	CO2 % 1-Min
4/28 17:32	9.83
4/28 17:33	9.88
4/28 17:34	9.86
4/28 17:35	9.88
4/28 17:36	9.83
4/28 17:37	9.84
4/28 17:38	9.84
4/28 17:39	9.86
4/28 17:40	9.87
4/28 17:41	9.85
4/28 17:42	9.78
4/28 17:43	9.75
4/28 17:44	9.81
4/28 17:45	9.86
4/28 17:46	9.92
4/28 17:47	9.90
4/28 17:48	9.87
4/28 17:49	9.81
4/28 17:50	9.78
4/28 17:51	9.73
4/28 17:52	9.77
4/28 17:53	9.77
Average (all)	9.83
Total (all)	--
Minimum (all)	9.73
Maximum (all)	9.92
Average (valid values only)	9.83
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 1:12 PM thru 4/29/2015 1:33 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 13:12	12.61
4/29 13:13	12.61
4/29 13:14	12.61
4/29 13:15	12.64
4/29 13:16	12.59
4/29 13:17	12.62
4/29 13:18	12.67
4/29 13:19	12.75
4/29 13:20	12.75
4/29 13:21	12.69
4/29 13:22	12.68
4/29 13:23	12.66
4/29 13:24	12.65
4/29 13:25	12.52
4/29 13:26	12.51
4/29 13:27	12.52
4/29 13:28	12.52
4/29 13:29	12.52
4/29 13:30	12.59
4/29 13:31	12.59
4/29 13:32	12.59
4/29 13:33	12.60
Average (all)	12.61
Total (all)	--
Minimum (all)	12.51
Maximum (all)	12.75
Average (valid values only)	12.61
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 2:14 PM thru 4/29/2015 2:35 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 14:14	11.99
4/29 14:15	12.79
4/29 14:16	13.94
4/29 14:17	13.35
4/29 14:18	12.71
4/29 14:19	12.53
4/29 14:20	12.62
4/29 14:21	12.62
4/29 14:22	12.86
4/29 14:23	12.99
4/29 14:24	12.99
4/29 14:25	12.99
4/29 14:26	12.95
4/29 14:27	12.96
4/29 14:28	13.13
4/29 14:29	12.96
4/29 14:30	12.72
4/29 14:31	12.36
4/29 14:32	11.96
4/29 14:33	12.14
4/29 14:34	12.63
4/29 14:35	13.42 <25>
Average (all)	12.80
Total (all)	--
Minimum (all)	11.96
Maximum (all)	13.94
Average (valid values only)	12.77
Total (valid values only)	--
Count (valid values only)	21

<25> = Backflush

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 3:15 PM thru 4/29/2015 3:36 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 15:15	12.95
4/29 15:16	12.95
4/29 15:17	12.95
4/29 15:18	12.95
4/29 15:19	12.84
4/29 15:20	12.97
4/29 15:21	13.02
4/29 15:22	12.93
4/29 15:23	13.12
4/29 15:24	13.09
4/29 15:25	13.03
4/29 15:26	13.00
4/29 15:27	13.08
4/29 15:28	13.11
4/29 15:29	13.06
4/29 15:30	13.03
4/29 15:31	13.09
4/29 15:32	13.05
4/29 15:33	13.05
4/29 15:34	13.00
4/29 15:35	13.02
4/29 15:36	13.05
Average (all)	13.02
Total (all)	--
Minimum (all)	12.84
Maximum (all)	13.12
Average (valid values only)	13.02
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/29/2015 4:20 PM thru 4/29/2015 4:41 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/29 16:20	12.88
4/29 16:21	12.67
4/29 16:22	12.61
4/29 16:23	12.76
4/29 16:24	12.81
4/29 16:25	12.59
4/29 16:26	12.46
4/29 16:27	12.49
4/29 16:28	12.38
4/29 16:29	12.35
4/29 16:30	12.72
4/29 16:31	12.80
4/29 16:32	12.93
4/29 16:33	12.94
4/29 16:34	12.94
4/29 16:35	12.91
4/29 16:36	12.85
4/29 16:37	12.82
4/29 16:38	12.84
4/29 16:39	12.98
4/29 16:40	12.98
4/29 16:41	12.74
Average (all)	12.75
Total (all)	--
Minimum (all)	12.35
Maximum (all)	12.98
Average (valid values only)	12.75
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 7:43 AM thru 4/30/2015 8:04 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 7:43	12.94
4/30 7:44	12.94
4/30 7:45	12.95
4/30 7:46	12.96
4/30 7:47	12.96
4/30 7:48	12.96
4/30 7:49	12.96
4/30 7:50	12.96
4/30 7:51	12.96
4/30 7:52	12.97
4/30 7:53	12.93
4/30 7:54	12.92
4/30 7:55	12.92
4/30 7:56	12.91
4/30 7:57	12.91
4/30 7:58	12.93
4/30 7:59	12.99
4/30 8:00	13.10
4/30 8:01	13.14
4/30 8:02	13.14
4/30 8:03	13.14
4/30 8:04	13.10
Average (all)	12.99
Total (all)	--
Minimum (all)	12.91
Maximum (all)	13.14
Average (valid values only)	12.99
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 9:11 AM thru 4/30/2015 9:32 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 9:11	13.03
4/30 9:12	13.08
4/30 9:13	13.16
4/30 9:14	13.22
4/30 9:15	13.22
4/30 9:16	13.22
4/30 9:17	13.19
4/30 9:18	13.18
4/30 9:19	13.18
4/30 9:20	13.10
4/30 9:21	13.03
4/30 9:22	13.13
4/30 9:23	13.14
4/30 9:24	13.14
4/30 9:25	13.14
4/30 9:26	13.14
4/30 9:27	13.20
4/30 9:28	13.26
4/30 9:29	13.26
4/30 9:30	13.26
4/30 9:31	13.20
4/30 9:32	13.19
Average (all)	13.17
Total (all)	--
Minimum (all)	13.03
Maximum (all)	13.26
Average (valid values only)	13.17
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 10:23 AM thru 4/30/2015 10:44 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 10:23	13.29
4/30 10:24	13.24
4/30 10:25	13.19
4/30 10:26	13.07
4/30 10:27	13.05
4/30 10:28	13.06
4/30 10:29	13.11
4/30 10:30	13.14
4/30 10:31	13.15
4/30 10:32	13.15
4/30 10:33	13.11
4/30 10:34	12.99
4/30 10:35	12.99
4/30 10:36	13.06
4/30 10:37	13.10
4/30 10:38	13.12
4/30 10:39	13.11
4/30 10:40	13.06
4/30 10:41	13.02
4/30 10:42	13.01
4/30 10:43	13.01
4/30 10:44	13.02
Average (all)	13.09
Total (all)	--
Minimum (all)	12.99
Maximum (all)	13.29
Average (valid values only)	13.09
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 11:30 AM thru 4/30/2015 11:51 AM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 11:30	13.13
4/30 11:31	13.16
4/30 11:32	13.12
4/30 11:33	13.05
4/30 11:34	13.01
4/30 11:35	13.03
4/30 11:36	13.01
4/30 11:37	13.03
4/30 11:38	13.04
4/30 11:39	13.06
4/30 11:40	12.99
4/30 11:41	12.95
4/30 11:42	12.87
4/30 11:43	12.85
4/30 11:44	12.87
4/30 11:45	12.95
4/30 11:46	12.78
4/30 11:47	12.76
4/30 11:48	12.85
4/30 11:49	12.88
4/30 11:50	12.90
4/30 11:51	12.93
Average (all)	12.96
Total (all)	--
Minimum (all)	12.76
Maximum (all)	13.16
Average (valid values only)	12.96
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 4/30/2015 12:34 PM thru 4/30/2015 12:55 PM

Timestamp	(Boiler 1) CO2% 1-Min
4/30 12:34	12.68
4/30 12:35	12.61
4/30 12:36	12.69
4/30 12:37	12.70
4/30 12:38	12.70
4/30 12:39	12.69
4/30 12:40	12.69
4/30 12:41	12.71
4/30 12:42	12.72
4/30 12:43	12.72
4/30 12:44	12.72
4/30 12:45	12.72
4/30 12:46	12.73
4/30 12:47	12.81
4/30 12:48	12.92
4/30 12:49	12.92
4/30 12:50	12.91
4/30 12:51	12.90
4/30 12:52	12.87
4/30 12:53	12.87
4/30 12:54	12.98
4/30 12:55	13.03
Average (all)	12.79
Total (all)	--
Minimum (all)	12.61
Maximum (all)	13.03
Average (valid values only)	12.79
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 8:43 AM thru 5/4/2015 9:04 AM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 8:43	11.38
5/4 8:44	11.37
5/4 8:45	11.32
5/4 8:46	11.31
5/4 8:47	11.31
5/4 8:48	11.31
5/4 8:49	11.31
5/4 8:50	11.31
5/4 8:51	11.38
5/4 8:52	11.44
5/4 8:53	11.38
5/4 8:54	11.42
5/4 8:55	11.42
5/4 8:56	11.45
5/4 8:57	11.74
5/4 8:58	11.79
5/4 8:59	11.76
5/4 9:00	11.35
5/4 9:01	11.28
5/4 9:02	10.90
5/4 9:03	10.90
5/4 9:04	10.91
Average (all)	11.35
Total (all)	--
Minimum (all)	10.90
Maximum (all)	11.79
Average (valid values only)	11.35
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 9:27 AM thru 5/4/2015 9:48 AM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 9:27	11.73
5/4 9:28	11.73
5/4 9:29	11.74
5/4 9:30	11.75
5/4 9:31	11.76
5/4 9:32	11.83
5/4 9:33	11.83
5/4 9:34	11.84
5/4 9:35	11.81
5/4 9:36	11.78
5/4 9:37	11.77
5/4 9:38	11.77
5/4 9:39	11.77
5/4 9:40	11.77
5/4 9:41	11.74
5/4 9:42	11.69
5/4 9:43	11.71
5/4 9:44	11.71
5/4 9:45	11.71
5/4 9:46	11.83
5/4 9:47	11.75
5/4 9:48	11.69
Average (all)	11.76
Total (all)	--
Minimum (all)	11.69
Maximum (all)	11.84
Average (valid values only)	11.76
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 10:19 AM thru 5/4/2015 10:40 AM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 10:19	11.98
5/4 10:20	12.01
5/4 10:21	12.01
5/4 10:22	12.01
5/4 10:23	11.98
5/4 10:24	12.05
5/4 10:25	12.07
5/4 10:26	12.00
5/4 10:27	12.04
5/4 10:28	12.05
5/4 10:29	12.01
5/4 10:30	12.05
5/4 10:31	12.05
5/4 10:32	12.05
5/4 10:33	12.05
5/4 10:34	12.04
5/4 10:35	12.03
5/4 10:36	12.00
5/4 10:37	12.00
5/4 10:38	12.00
5/4 10:39	12.00
5/4 10:40	12.00
Average (all)	12.02
Total (all)	--
Minimum (all)	11.98
Maximum (all)	12.07
Average (valid values only)	12.02
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 11:12 AM thru 5/4/2015 11:33 AM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 11:12	11.91
5/4 11:13	11.91
5/4 11:14	11.91
5/4 11:15	11.91
5/4 11:16	11.90
5/4 11:17	11.90
5/4 11:18	11.91
5/4 11:19	11.87
5/4 11:20	11.94
5/4 11:21	11.92
5/4 11:22	11.91
5/4 11:23	12.07
5/4 11:24	12.21
5/4 11:25	12.19
5/4 11:26	12.19
5/4 11:27	12.04
5/4 11:28	11.83
5/4 11:29	11.87
5/4 11:30	11.90
5/4 11:31	11.85
5/4 11:32	11.99
5/4 11:33	12.01
Average (all)	11.96
Total (all)	--
Minimum (all)	11.83
Maximum (all)	12.21
Average (valid values only)	11.96
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 12:08 PM thru 5/4/2015 12:29 PM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 12:08	12.19
5/4 12:09	11.93
5/4 12:10	11.91
5/4 12:11	12.06
5/4 12:12	12.12
5/4 12:13	12.11
5/4 12:14	12.07
5/4 12:15	12.08
5/4 12:16	12.09
5/4 12:17	12.09
5/4 12:18	12.06
5/4 12:19	12.05
5/4 12:20	12.04
5/4 12:21	12.03
5/4 12:22	12.03
5/4 12:23	12.03
5/4 12:24	12.01
5/4 12:25	12.01
5/4 12:26	12.01
5/4 12:27	12.01
5/4 12:28	12.00
5/4 12:29	12.00
Average (all)	12.04
Total (all)	--
Minimum (all)	11.91
Maximum (all)	12.19
Average (valid values only)	12.04
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 12:58 PM thru 5/4/2015 1:19 PM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 12:58	11.87
5/4 12:59	11.92
5/4 13:00	11.95
5/4 13:01	12.00
5/4 13:02	12.00
5/4 13:03	12.01
5/4 13:04	12.01
5/4 13:05	12.02
5/4 13:06	12.02
5/4 13:07	12.03
5/4 13:08	12.03
5/4 13:09	12.02
5/4 13:10	12.03
5/4 13:11	12.02
5/4 13:12	11.97
5/4 13:13	12.05
5/4 13:14	12.05
5/4 13:15	12.10
5/4 13:16	12.26
5/4 13:17	12.26
5/4 13:18	12.20
5/4 13:19	12.14
Average (all)	12.04
Total (all)	--
Minimum (all)	11.87
Maximum (all)	12.26
Average (valid values only)	12.04
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 1:44 PM thru 5/4/2015 2:05 PM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 13:44	12.08
5/4 13:45	12.06
5/4 13:46	12.07
5/4 13:47	12.06
5/4 13:48	12.01
5/4 13:49	12.07
5/4 13:50	12.03
5/4 13:51	12.00
5/4 13:52	12.00
5/4 13:53	11.94
5/4 13:54	11.93
5/4 13:55	11.96
5/4 13:56	11.93
5/4 13:57	11.91
5/4 13:58	12.28
5/4 13:59	12.59
5/4 14:00	12.43
5/4 14:01	12.39
5/4 14:02	12.36
5/4 14:03	12.20
5/4 14:04	11.95
5/4 14:05	11.91
Average (all)	12.10
Total (all)	--
Minimum (all)	11.91
Maximum (all)	12.59
Average (valid values only)	12.10
Total (valid values only)	--
Count (valid values only)	22

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CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 2:30 PM thru 5/4/2015 2:51 PM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 14:30	12.02
5/4 14:31	12.00
5/4 14:32	11.97
5/4 14:33	11.97
5/4 14:34	11.97
5/4 14:35	11.96
5/4 14:36	11.95
5/4 14:37	11.96
5/4 14:38	12.00
5/4 14:39	12.00
5/4 14:40	12.00
5/4 14:41	12.00
5/4 14:42	12.00
5/4 14:43	12.00
5/4 14:44	11.92
5/4 14:45	11.96
5/4 14:46	12.02
5/4 14:47	12.03
5/4 14:48	12.03
5/4 14:49	12.02
5/4 14:50	12.02
5/4 14:51	12.04
Average (all)	11.99
Total (all)	--
Minimum (all)	11.92
Maximum (all)	12.04
Average (valid values only)	11.99
Total (valid values only)	--
Count (valid values only)	22

CeDAR 1-Minute Data

Solvay Chemical

Data for 5/4/2015 3:18 PM thru 5/4/2015 3:39 PM

Timestamp	(Boiler 2) CO2% 1-Min
5/4 15:18	11.96
5/4 15:19	11.96
5/4 15:20	11.95
5/4 15:21	11.95
5/4 15:22	11.95
5/4 15:23	11.95
5/4 15:24	11.95
5/4 15:25	11.94
5/4 15:26	11.94
5/4 15:27	11.95
5/4 15:28	11.96
5/4 15:29	11.96
5/4 15:30	11.96
5/4 15:31	11.96
5/4 15:32	11.97
5/4 15:33	11.96
5/4 15:34	11.94
5/4 15:35	11.94
5/4 15:36	11.93
5/4 15:37	11.93
5/4 15:38	11.93
5/4 15:39	11.93
Average (all)	11.95
Total (all)	--
Minimum (all)	11.93
Maximum (all)	11.97
Average (valid values only)	11.95
Total (valid values only)	--
Count (valid values only)	22

Optimal
AIR TESTING SERVICES, INC

APPENDIX D

Reference Method Spreadsheet Printouts

CEMS RUN SHEET

Client: Solvay Chemicals **Location:** Vertical Stack **Facility:** Green River **Source:** BO-1
Job No.: 1501C **Date:** 4/29/15 **Operator:** Ed **Run Length:** 21 min.

GAS	RANGE	HIGH CAL	MID CAL	Gas Value		Cylinder Number	
NOx	0 - 501.7 ppm	501.70 ppm	248.51 ppm	501.70 ppm		CC188738	
O2	0 - 22.92 %	22.92 %	11.96 %	22.92 %	11.96	CC99429	CC252480
CO2	0 - 22.91 %	22.91 %	11.98 %	22.91 %	11.98	CC99429	CC252480
SO2	0 - 50.0 ppm	50.00 ppm	25.00 ppm	504.70 ppm		CC188738	

Analyzer	CAI ZRE	CAI ZRE	CAI ZRE	API T100H	
	NOx	**O2**	**CO2**	**SO2**	
Direct	RESPONSE	RESPONSE	RESPONSE	RESPONSE	
Zero	0.18	0.02	0.02	0.03	
High	502.25	22.91	22.92	50.03	
Mid	247.94	11.91	11.79	24.71	
Initial Bias/Drift	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.21	0.16	0.05	-0.08	
Span	248.52	11.08	11.61	23.48	
run time:	**13:12 to 13:33**	**to 01:17**			
Run 1	**NOx**	**O2**	**CO2**	**SO2**	
Zero	1.71	0.15	0.04	0.73	
Span	249.51	11.17	11.6	24.39	
Raw	293.835	6.507	12.006	0.782	
Corrected	**293.41**	**6.93**	**12.40**	**0.48**	
run time:	**14:14 to 14:35**				
Run 2	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.80	0.12	0.03	0.37	
Span	250.14	11.79	11.62	24.12	
Raw	293.184	6.705	12.246	0.456	0.000
Corrected	**291.86**	**6.93**	**12.64**	**-0.10**	
run time:	**15:15 to 15:36**				
Run 3	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.82	0.10	0.03	0.83	
Span	249.23	11.95	11.61	24.87	
Raw	293.966	6.599	12.463	-0.261	0.000
Corrected	**292.73**	**6.60**	**12.86**	**-0.90**	
run time:	**16:20**				
Run 4	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.27	0.07	0.01	0.63	
Span	249.23	11.94	11.61	24.19	
Raw	290.126	7.019	12.168	0.344	0.000
Corrected	**289.38**	**6.99**	**12.56**	**-0.41**	

CEMS RUN SHEET

Client: Solvay Chemicals | **Location:** Vertical Stack | **Facility:** Green River | **Source:** BO-1
Job No.: 1501C | **Date:** 4/30/15 | **Operator:** Ed | **Run Length:** 21 min.

GAS	RANGE	HIGH CAL	MID CAL	Gas Value		Cylinder Number	
NOx	0 - 501.7 ppm	501.70 ppm	248.51 ppm	501.70 ppm		CC188738	
O2	0 - 22.92 %	22.92 %	11.96 %	22.92 %	11.96	CC99429	CC252480
CO2	0 - 22.91 %	22.91 %	11.98 %	22.91 %	11.98	CC99429	CC252480
SO2	0 - 50.0 ppm	50.00 ppm	25.00 ppm	504.70 ppm		CC188738	

Analyzer	CAI ZRE	CAI ZRE	CAI ZRE	API T100H	
	NOx	O2	CO2	SO2	
Direct	RESPONSE	RESPONSE	RESPONSE	RESPONSE	
Zero	0.12	0.18	0.03	-0.06	
High	501.96	22.92	22.92	50.54	
Mid	250.18	11.96	11.98	24.83	
Initial Bias/Drift	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.11	0.23	0.03	0.34	
Span	242.12	11.76	11.87	23.07	
run time:	**7:43 to 08:04**		**to 01:17**		
Run 5	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.18	0.11	0.05	1.42	
Span	243.33	11.82	11.83	23.75	
Raw	289.095	6.872	12.517	2.180	
Corrected	**296.01**	**6.90**	**12.66**	**1.44**	
run time:	**9:11 to 09:32**				
Run 6	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.18	0.17	0.04	0.59	
Span	241.91	11.74	11.86	23.46	
Raw	289.726	6.679	12.660	2.493	0.000
Corrected	**296.80**	**6.72**	**12.81**	**1.65**	
run time:	**10:23 to 10:44**				
Run 7	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.20	0.16	0.04	0.68	
Span	241.88	11.58	11.83	23.69	
Raw	288.267	6.750	12.510	2.125	0.000
Corrected	**296.19**	**6.85**	**12.65**	**1.62**	
run time:	**11:30**				
Run 8	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.27	0.10	0.03	0.79	
Span	242.52	11.39	11.77	24.29	
Raw	285.968	6.760	11.903	2.270	0.000
Corrected	**293.46**	**6.98**	**12.09**	**1.65**	
run time:	**12:34**				
Run 9	**NOx**	**O2**	**CO2**	**SO2**	
Zero	0.29	0.09	0.02	0.91	
Span	242.27	11.24	11.75	23.62	
Raw	283.470	6.973	12.021	2.223	0.000
Corrected	**290.67**	**7.33**	**12.25**	**1.49**	

CEMS RUN SHEET

Client: Solvay Chemicals **Location:** Vertical Stack **Facility:** Green River **Source:** BO-2
Job No.: 1501C **Date:** 5/4/15 **Operator:** Ed **Run Length:** 21 min.

GAS	RANGE	HIGH CAL	MID CAL	Gas Value	Cylinder Number	
NOx	0 - 501.7 ppm	501.70 ppm	248.51 ppm	501.70 ppm	CC188738	
O2	0 - 22.92 %	22.92 %	12.00 %	22.92 %	CC99429	CC99429
CO2	0 - 22.91 %	22.91 %	11.99 %	22.91 %	CC99429	CC99429
SO2	0 - 50.0 ppm	50.00 ppm	25.00 ppm	504.70 ppm	CC188738	

Analyzer	CAI ZRE	CAI ZRE	CAI ZRE	API T100H
	NOx	**O2**	**CO2**	**SO2**
Direct	RESPONSE	RESPONSE	RESPONSE	RESPONSE
Zero	0.57	0.21	0.04	0.03
High	502.63	22.92	22.92	49.38
Mid	248.90	11.96	11.98	24.82

Initial Bias/Drift	NOx	O2	CO2	SO2
Zero	0.33	0.32	0.06	0.54
Span	246.43	11.84	11.79	23.71

run time: **8:43 to 09:04**

Run 1	NOx	O2	CO2	SO2
Zero	0.47	0.29	0.07	0.87
Span	247.58	11.81	11.77	24.61
Raw	268.167	8.510	10.848	2.157
Corrected	**269.84**	**8.55**	**11.04**	**1.55**

run time: **9:27 to 09:48**

Run 2	NOx	O2	CO2	SO2
Zero	0.50	0.19	0.06	1.29
Span	246.61	11.77	11.73	23.52
Raw	269.218	8.030	11.212	2.085
Corrected	**270.80**	**8.09**	**11.44**	**1.09**

run time: **10:19 to 10:40**

Run 3	NOx	O2	CO2	SO2
Zero	0.53	0.17	0.04	1.35
Span	246.51	11.73	11.69	24.35
Raw	268.570	7.663	11.442	2.399
Corrected	**270.74**	**7.76**	**11.71**	**1.19**

run time: **11:12 to 11:33**

Run 4	NOx	O2	CO2	SO2
Zero	0.57	0.13	0.04	1.44
Span	245.21	11.57	11.67	24.63
Raw	266.852	7.710	11.350	3.621
Corrected	**269.78**	**7.89**	**11.65**	**2.41**

run time: **12:08 to 12:29**

Run 5	NOx	O2	CO2	SO2
Zero	0.57	0.18	0.06	1.95
Span	245.43	11.48	11.62	24.56
Raw	264.465	7.516	11.394	4.522
Corrected	**267.95**	**7.77**	**11.73**	**3.09**

run time: **12:58 to 13:19**

Run 6	**NOx**	**O2**	**CO2**	**SO2**
Zero	0.55	0.13	0.04	1.91
Span	245.25	11.93	11.67	25.13
Raw	264.833	7.801	11.447	5.132
Corrected	**268.30**	**7.94**	**11.78**	**3.49**

run time: **13:44 to 14:05**

Run 7	**NOx**	**O2**	**CO2**	**SO2**
Zero	-0.02	0.07	0.06	1.76
Span	246.43	11.75	11.77	24.36
Raw	262.219	7.605	11.562	5.758
Corrected	**265.08**	**7.67**	**11.83**	**4.28**

run time: **14:30 to 14:51**

Run 8	**NOx**	**O2**	**CO2**	**SO2**
Zero	0.59	0.13	0.04	1.83
Span	246.52	11.91	11.68	23.87
Raw	260.306	7.696	11.494	6.066
Corrected	**262.47**	**7.77**	**11.75**	**4.78**

run time: **15:18 to 15:39**

Run 9	**NOx**	**O2**	**CO2**	**SO2**
Zero	0.53	0.11	0.04	1.76
Span	247.41	11.80	11.71	24.13
Raw	260.181	7.745	11.436	2.115
Corrected	**261.84**	**7.80**	**11.72**	**0.36**

CEMS RUN SHEET

Client: Solvay Chemicals **Location:** Vertical Stack **Facility:** Green River **Source:** BO-4
Job No.: 1501C **Date:** 4/28/15 **Operator:** Ed **Run Length:** 21 min.

GAS	RANGE	HIGH CAL	MID CAL	Gas Value	Cylinder Number
NOx	0 - 49.7 ppm	49.70 ppm	24.85 ppm	501.70 ppm	CC188738
CO	0 - 49.4 ppm	49.37 ppm	24.68 ppm	498.30 ppm	CC188738
O2	0 - 22.92 %	22.92 %	12.00 %	22.92 %	CC99429
CO2	0 - 22.91 %	22.91 %	11.99 %	22.91 %	CC99429
		Verification Gas	O2	11.99 %	EB0033423

Analyzer	CAI ZRE	CAI ZRE	CAI ZRE	CAI ZRE	API 100A
	NOx	**CO**	**O2**	**CO2**	
Direct	RESPONSE	RESPONSE	RESPONSE	RESPONSE	
Zero	0.05	0.05	0.18	0.01	
High	50.35	49.54	22.89	22.90	
Mid	24.86	24.67	11.95	11.99	

205 Check	High Challenge	Mid Challenge	Verification
	15.00 %	**9.00 %**	**11.990 %**
1	14.97	9.04	12.01
2	14.93	9.04	12.02
3	14.99	9.03	12.01

Initial Bias/Drift	**NOx**	**CO**	**O2**	**CO2**
Zero	0.05	0.32	0.20	0.04
Span	24.82	24.52	11.64	11.85

run time: **12:04 to 12:25**

Run 1	**NOx**	**CO**	**O2**	**CO2**
Zero	0.01	0.24	0.06	0.05
Span	25.50	24.44	11.56	11.73
Raw	8.365	0.436	3.892	9.436
Corrected	**8.24**	**0.16**	**3.94**	**9.59**

run time: **12:52 to 13:13**

Run 2	**NOx**	**CO**	**O2**	**CO2**
Zero	0.16	0.14	0.05	0.03
Span	24.41	24.38	11.36	11.69
Raw	8.304	0.090	4.009	9.450
Corrected	**8.21**	**-0.10**	**4.16**	**9.67**

run time: **13:44 to 14:05**

Run 3	**NOx**	**CO**	**O2**	**CO2**
Zero	0.03	0.08	0.06	0.06
Span	24.58	24.20	11.26	11.68
Raw	8.308	0.040	3.911	9.434
Corrected	**8.36**	**-0.07**	**4.11**	**9.67**

run time: **14:26 to 14:47**

Run 4	**NOx**	**CO**	**O2**	**CO2**
Zero	0.21	0.04	0.09	0.07
Span	24.79	24.08	11.25	11.64
Raw	8.562	0.040	3.895	9.415

Corrected	**8.54**	**-0.02**	**4.10**	**9.67**

run time:	**15:18 to 15:39**			
Run 5	**NOx**	**CO**	**O2**	**CO2**
Zero	1.03	-0.01	0.05	0.06
Span	24.71	23.87	11.25	11.64
Raw	8.810	-0.005	3.880	9.402
Corrected	**8.43**	**-0.02**	**4.09**	**9.67**

run time:	**16:03 to 16:24**			
Run 6	**NOx**	**CO**	**O2**	**CO2**
Zero	0.19	0.04	0.07	0.04
Span	24.64	23.99	11.32	11.61
Raw	9.303	-0.101	3.896	9.379
Corrected	**8.98**	**-0.12**	**4.10**	**9.66**

run time:	**16:52 to 17:13**			
Run 7	**NOx**	**CO**	**O2**	**CO2**
Zero	0.01	0.05	0.07	0.05
Span	24.49	24.06	11.32	11.62
Raw	8.440	0.017	3.939	9.376
Corrected	**8.47**	**-0.03**	**4.13**	**9.67**

run time:	**17:32 to 17:53**			
Run 8	**NOx**	**CO**	**O2**	**CO2**
Zero	-0.21	-0.07	0.03	0.05
Span	24.17	24.02	11.36	11.61
Raw	7.932	-0.122	3.927	9.370
Corrected	**8.17**	**-0.12**	**4.12**	**9.66**

run time:	**18:14 to 18:35**			
Run 9	**NOx**	**CO**	**O2**	**CO2**
Zero	-0.34	-0.17	0.07	0.05
Span	24.08	23.81	11.44	11.62
Raw	8.220	-0.107	3.965	9.343
Corrected	**8.65**	**0.01**	**4.14**	**9.63**

Solvay Chemicals | Facility: Green River | Source: BO-1

April 29, 2015 | Site: Vertical Stack | Job No.: 1501C

RM Analyzer Results	Units	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9
RM (CEM) Run Start Time	hr:min	14:32	15:31	16:32	17:37	10:03	10:48	14:30	15:01	15:31
RM (CEM) Run Stop Time	hr:min	14:53	15:52	16:53	17:58	10:24	11:09	14:51	15:22	15:52
Dry Carbon Dioxide, CO_2	%	12.40	12.64	12.86	12.56	12.66	12.81	12.65	12.09	12.25
Dry Oxygen, O_2	%	6.93	6.93	6.60	6.99	6.90	6.72	6.85	6.98	7.33
Calculated Gas Parameters										
Gas Sampled, V_{mstd}	ft^3	26.16	26.16	27.67	27.67	28.66	28.66	28.65	28.65	25.03
Water Vapor Sampled, V_{wstd}	ft^3	4.49	4.49	4.85	4.85	4.62	4.62	4.78	4.78	4.18
Moisture Conc., B_w, by volume	%	14.64	14.64	14.92	14.92	13.89	13.89	14.29	14.29	14.32
Temperature of Gas, T_s	Degrees F	118.8	119.0	119.3	118.9	119.6	119.8	120.3	119.6	119.9
Moisture Conc., B_{ws}, Saturated	%	13.385	13.479	13.600	13.433	13.718	13.767	13.961	13.718	13.815
Actual Moisture Concentration	%	13.38	13.48	13.60	13.43	13.72	13.77	13.96	13.72	13.81
Dry Molecular Weight, M_d	lb/lb-mole	30.26	30.30	30.32	30.29	30.30	30.32	30.30	30.21	30.25
Wet Molecular Weight, M_s	lb/lb-mole	28.62	28.64	28.65	28.64	28.61	28.62	28.58	28.54	28.56
Absolute Stack Pressure, P_s	In. Hg	23.79	23.79	23.79	23.79	23.79	23.79	23.79	23.79	23.79
Velocity, v_s	ft/min	2307	2378	2450	2415	2473	2507	2454	2417	2345
Actual Flow Rate, Qa, acfm	ft^3	94,972	97,891	100,833	99,394	101,809	103,216	101,000	99,500	96,532
Dry Standard Flow Rate, Q_{std}, dscfm	ft^3	59,651	61,390	63,107	62,373	63,606	64,435	62,859	62,168	60,218
Wet Standard Flow Rate, Q_w, scfm	ft^3	68,868	70,954	73,041	72,052	73,720	74,722	73,059	72,052	69,870

Solvay Chemicals | Facility: Green River | Source: BO-2

May 4, 2015 | Site: Vertical Stack | Job No.: 1501C

RM Analyzer Results	Units	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9
RM (CEM) Run Start Time	hr:min	14:32	15:31	16:32	17:37	10:03	10:48	14:30	15:01	16:35
RM (CEM) Run Stop Time	hr:min	14:53	15:52	16:53	17:58	10:24	11:09	14:51	15:22	16:56
Dry Carbon Dioxide, CO_2	%	11.04	11.44	11.71	11.65	11.73	11.78	11.83	11.75	11.75
Dry Oxygen, O_2	%	8.55	8.09	7.76	7.89	7.77	7.94	7.67	7.77	7.80
Calculated Gas Parameters										
Gas Sampled, V_{mstd}	ft^3	29.32	29.32	29.54	29.54	28.91	28.91	28.56	28.56	25.78
Water Vapor Sampled, V_{wstd}	ft^3	4.05	4.05	4.72	4.72	4.33	4.33	4.38	4.38	3.94
Moisture Conc., B_w, by volume	%	12.14	12.14	13.78	13.78	13.01	13.01	13.30	13.30	13.24
Temperature of Gas, T_s	Degrees F	114.3	114.2	115.3	115.0	115.5	115.8	115.3	115.0	115.3
Moisture Conc., B_{ws}, Saturated	%	11.793	11.765	12.165	12.049	12.226	12.314	12.166	12.050	12.173
Actual Moisture Concentration	%	11.79	11.76	12.17	12.05	12.23	12.31	12.17	12.05	12.17
Dry Molecular Weight, M_d	lb/lb-mole	30.11	30.15	30.18	30.18	30.19	30.20	30.20	30.19	30.19
Wet Molecular Weight, M_s	lb/lb-mole	28.68	28.72	28.70	28.71	28.70	28.70	28.72	28.72	28.71
Absolute Stack Pressure, P_s	In. Hg	23.75	23.75	23.75	23.75	23.74	23.74	23.75	23.75	23.73
Velocity, v_s	ft/min	2547	2602	2627	2676	2614	2580	2634	2637	2648
Actual Flow Rate, Qa, acfm	ft^3	103,044	105,256	106,277	108,276	105,756	104,358	106,558	106,671	107,129
Dry Standard Flow Rate, Q_{std}, dscfm	ft^3	66,306	67,761	67,972	69,382	67,557	66,568	68,146	68,348	68,465
Wet Standard Flow Rate, Q_w, scfm	ft^3	75,171	76,795	77,386	78,887	76,967	75,917	77,585	77,713	77,955

Optimal Air Testing

Solvay Chemicals Facility: Green River Source: BO-4

28-Apr-15 Site: Stack Job No.: 1501C

RM Analyzer Results	Units	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9
RM (CEM) Run Start Time	hr:min	11:11	12:09	13:39	12:50	13:24	13:57	14:30	15:01	15:31
RM (CEM) Run Stop Time	hr:min	11:32	12:30	14:00	13:11	13:45	14:18	14:51	15:22	15:52
Dry Oxygen, O_2	%	3.94	4.16	4.11	4.10	4.09	4.10	4.13	4.12	4.14
Dry Carbon Dioxide, CO_2	%	9.59	9.67	9.67	9.67	9.67	9.66	9.67	9.66	9.63
Measured/Calculated Gas Parameters										
		Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 9
Condensate:	grams	110.40	110.40	113.80	113.80	111.90	111.90	112.90	112.90	100.00
Gas Sampled, actual measured volume	ft^3	35.66	35.66	36.01	36.01	36.07	36.07	36.14	36.14	30.81
Gas Sampled, Vmstd	ft^3	27.70	27.70	27.61	27.61	27.50	27.50	27.67	27.67	23.80
Water Vapor Sampled, Vwstd	ft^3	5.20	5.20	5.36	5.36	5.27	5.27	5.31	5.31	4.71
Moisture Concentration, Bw	%	15.80	15.80	16.25	16.25	16.08	16.08	16.11	16.11	16.51
Velocity head (Sq. root of Δp)	$\sqrt{}$in. H_2O	0.6269	0.6306	0.6203	0.6279	0.6370	0.6463	0.6311	0.6312	0.6404
Effluent Gas Temperature	Degrees F	328	330	327	328	329	330	329	328	329
Static Pressure	in. H_2O	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10	-0.10
Dry Molecular Weight, Md	lb/lb-mole	29.69	29.71	29.71	29.71	29.71	29.71	29.71	29.71	29.71
Wet Molecular Weight, Ms	lb/lb-mole	27.84	27.86	27.81	27.81	27.83	27.83	27.83	27.82	27.77
Barometric Pressure, Pb	In. Hg	23.85	23.85	23.85	23.85	23.85	23.85	23.84	23.84	23.84
Absolute Stack Pressure, Ps	In. Hg	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84	23.84
Velocity, v_s	ft/min	2943	2964	2912	2950	2992	3039	2965	2964	3013
Actual Flow Rate, Qa, acfm	ft^3	83,072	83,649	82,193	83,253	84,461	85,785	83,702	83,661	85,045
Dry Standard Flow Rate, Qstd, dscfm	ft^3	37,327	37,479	36,779	37,211	37,805	38,317	37,278	37,402	37,984
Wet Standard Flow Rate, Qw, scfm	ft^3	44,331	44,511	43,916	44,431	45,046	45,656	44,437	44,584	45,495
Dry Standard Flow Rate, Qstd, kdscf/hr	ft^3	2,239.64	2,248.77	2,206.77	2,232.64	2,268.28	2,298.99	2,236.68	2,244.10	2,279.02

Run 1 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/29/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.21	0.16	0.05	-0.08
Initial Bias - span gas	248.52	11.08	11.61	23.48
Final Bias - Zero	1.71	0.15	0.04	0.73
Final Bias - span gas	249.51	11.17	11.60	24.39
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.01 %	0.61 %	0.13 %	0.22 %
Initial, bias gas	0.12 %	3.62 %	0.79 %	2.46 %
Final, zero gas	0.30 %	0.57 %	0.09 %	1.40 %
Final, bias gas	0.31 %	3.23 %	0.83 %	0.64 %
Analyzer Drift (allowable = 3%)				
zero gas	0.30 %	0.04 %	0.04 %	1.62 %
bias gas	0.20 %	0.39 %	0.04 %	1.82 %
Results				
Start/Stop Time	13:12 to 13:33			
Run 1 Average (raw data)	293.84	6.51	12.01	0.78
Drift corrected average	**293.41**	**6.93**	**12.40**	**0.48**

Run 2 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/29/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	1.71	0.15	0.04	0.73
Initial Bias - span gas	249.51	11.17	11.60	24.39
Final Bias - Zero	0.80	0.12	0.03	0.37
Final Bias - span gas	250.14	11.79	11.62	24.12
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.30 %	0.57 %	0.09 %	1.40 %
Initial, bias gas	0.31 %	3.23 %	0.83 %	0.64 %
Final, zero gas	0.12 %	0.44 %	0.04 %	0.68 %
Final, bias gas	0.44 %	0.52 %	0.74 %	1.18 %
Analyzer Drift (allowable = 3%)				
zero gas	0.18 %	0.13 %	0.04 %	0.72 %
bias gas	0.13 %	2.71 %	0.09 %	0.54 %
Results				
Start/Stop Time	14:14 to 14:35			
Run 2 Average (raw data)	293.18	6.70	12.25	0.46
Drift corrected average	**291.86**	**6.93**	**12.64**	**-0.10**

Run 3 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/29/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.80	0.12	0.03	0.37
Initial Bias - span gas	250.14	11.79	11.62	24.12
Final Bias - Zero	0.82	0.10	0.03	0.83
Final Bias - span gas	249.23	11.95	11.61	24.87
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.12 %	0.44 %	0.04 %	0.68 %
Initial, bias gas	0.44 %	0.52 %	0.74 %	1.18 %
Final, zero gas	0.13 %	0.35 %	0.04 %	1.60 %
Final, bias gas	0.26 %	0.17 %	0.79 %	0.32 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.09 %	0.00 %	0.92 %
bias gas	0.18 %	0.70 %	0.04 %	1.50 %
Results				
Start/Stop Time	15:15 to 15:36			
Run 3 Average (raw data)	293.97	6.60	12.46	-0.26
Drift corrected average	**292.73**	**6.60**	**12.86**	**-0.90**

Run 4 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/29/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.82	0.10	0.03	0.83
Initial Bias - span gas	249.23	11.95	11.61	24.87
Final Bias - Zero	0.27	0.07	0.01	0.63
Final Bias - span gas	249.23	11.94	11.61	24.19
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.13 %	0.35 %	0.04 %	1.60 %
Initial, bias gas	0.26 %	0.17 %	0.79 %	0.32 %
Final, zero gas	0.02 %	0.22 %	0.04 %	1.20 %
Final, bias gas	0.26 %	0.13 %	0.79 %	1.04 %
Analyzer Drift (allowable = 3%)				
zero gas	0.11 %	0.13 %	0.09 %	0.40 %
bias gas	0.00 %	0.04 %	0.00 %	1.36 %
Results				
Start/Stop Time	16:20 to 16:41			
Run 4 Average (raw data)	290.13	7.02	12.17	0.34
Drift corrected average	**289.38**	**6.99**	**12.56**	**-0.41**

Run 5 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/30/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.11	0.23	0.03	0.34
Initial Bias - span gas	242.12	11.76	11.87	23.07
Final Bias - Zero	0.18	0.11	0.05	1.42
Final Bias - span gas	243.33	11.82	11.83	23.75
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.22 %	0.00 %	0.80 %
Initial, bias gas	1.61 %	0.87 %	0.48 %	3.52 %
Final, zero gas	0.01 %	0.31 %	0.09 %	2.96 %
Final, bias gas	1.37 %	0.61 %	0.65 %	2.16 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.52 %	0.09 %	2.16 %
bias gas	0.24 %	0.26 %	0.17 %	1.36 %
Results				
Start/Stop Time	7:43 to 08:04			
Run 5 Average (raw data)	289.10	6.87	12.52	2.18
Drift corrected average	**296.01**	**6.90**	**12.66**	**1.44**

Run 6 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/30/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.18	0.11	0.05	1.42
Initial Bias - span gas	243.33	11.82	11.83	23.75
Final Bias - Zero	0.18	0.17	0.04	0.59
Final Bias - span gas	241.91	11.74	11.86	23.46
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.01 %	0.31 %	0.09 %	2.96 %
Initial, bias gas	1.37 %	0.61 %	0.65 %	2.16 %
Final, zero gas	0.01 %	0.04 %	0.04 %	1.30 %
Final, bias gas	1.65 %	0.96 %	0.52 %	2.74 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.26 %	0.04 %	1.66 %
bias gas	0.28 %	0.35 %	0.13 %	0.58 %
Results				
Start/Stop Time	9:11 to 09:32			
Run 6 Average (raw data)	289.73	6.68	12.66	2.49
Drift corrected average	**296.80**	**6.72**	**12.81**	**1.65**

Run 7 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/30/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.18	0.17	0.04	0.59
Initial Bias - span gas	241.91	11.74	11.86	23.46
Final Bias - Zero	0.20	0.16	0.04	0.68
Final Bias - span gas	241.88	11.58	11.83	23.69
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.01 %	0.04 %	0.04 %	1.30 %
Initial, bias gas	1.65 %	0.96 %	0.52 %	2.74 %
Final, zero gas	0.02 %	0.57 %	0.04 %	1.48 %
Final, bias gas	1.65 %	1.66 %	0.65 %	2.28 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.04 %	0.00 %	0.18 %
bias gas	0.01 %	0.70 %	0.13 %	0.46 %
Results				
Start/Stop Time	10:23 to 10:44			
Run 7 Average (raw data)	288.27	6.75	12.51	2.13
Drift corrected average	**296.19**	**6.85**	**12.65**	**1.62**

Run 8 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/30/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.20	0.16	0.04	0.68
Initial Bias - span gas	241.88	11.58	11.83	23.69
Final Bias - Zero	0.27	0.10	0.03	0.79
Final Bias - span gas	242.52	11.39	11.77	24.29
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.02 %	0.57 %	0.04 %	1.48 %
Initial, bias gas	1.65 %	1.66 %	0.65 %	2.28 %
Final, zero gas	0.03 %	0.31 %	0.00 %	1.70 %
Final, bias gas	1.53 %	2.49 %	0.92 %	1.08 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.26 %	0.04 %	0.22 %
bias gas	0.13 %	0.83 %	0.26 %	1.20 %
Results				
Start/Stop Time	11:30 to 11:51			
Run 8 Average (raw data)	285.97	6.76	11.90	2.27
Drift corrected average	**293.46**	**6.98**	**12.09**	**1.65**

Run 9 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-1
Project No.: 1501C
Date: 4/30/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	11.96	11.98	25.00
Analyzer Readings				
Initial Bias - Zero	0.27	0.10	0.03	0.79
Initial Bias - span gas	242.52	11.39	11.77	24.29
Final Bias - Zero	0.29	0.09	0.02	0.91
Final Bias - span gas	242.27	11.24	11.75	23.62
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.03 %	0.31 %	0.00 %	1.70 %
Initial, bias gas	1.53 %	2.49 %	0.92 %	1.08 %
Final, zero gas	0.03 %	0.26 %	0.04 %	1.94 %
Final, bias gas	1.58 %	3.14 %	1.00 %	2.42 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.04 %	0.04 %	0.24 %
bias gas	0.05 %	0.65 %	0.09 %	1.34 %
Results				
Start/Stop Time	12:34 to 12:55			
Run 9 Average (raw data)	283.47	6.97	12.02	2.22
Drift corrected average	**290.67**	**7.33**	**12.25**	**1.49**

Run 1 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.33	0.32	0.06	0.54
Initial Bias - span gas	246.43	11.84	11.79	23.71
Final Bias - Zero	0.47	0.29	0.07	0.87
Final Bias - span gas	247.58	11.81	11.77	24.61
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.05 %	0.48 %	0.09 %	1.02 %
Initial, bias gas	0.49 %	0.52 %	0.83 %	2.22 %
Final, zero gas	0.02 %	0.35 %	0.13 %	1.68 %
Final, bias gas	0.26 %	0.65 %	0.92 %	0.42 %
Analyzer Drift (allowable = 3%)				
zero gas	0.03 %	0.13 %	0.04 %	0.66 %
bias gas	0.23 %	0.13 %	0.09 %	1.80 %
Results				
Start/Stop Time	8:43 to 09:04			
Run 1 Average (raw data)	268.17	8.51	10.85	2.16
Drift corrected average	**269.84**	**8.55**	**11.04**	**1.55**

Run 2 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.47	0.29	0.07	0.87
Initial Bias - span gas	247.58	11.81	11.77	24.61
Final Bias - Zero	0.50	0.19	0.06	1.29
Final Bias - span gas	246.61	11.77	11.73	23.52
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.02 %	0.35 %	0.13 %	1.68 %
Initial, bias gas	0.26 %	0.65 %	0.92 %	0.42 %
Final, zero gas	0.01 %	0.09 %	0.09 %	2.52 %
Final, bias gas	0.46 %	0.83 %	1.09 %	2.60 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.44 %	0.04 %	0.84 %
bias gas	0.19 %	0.17 %	0.17 %	2.18 %
Results				
Start/Stop Time	9:27 to 09:48			
Run 2 Average (raw data)	269.22	8.03	11.21	2.09
Drift corrected average	**270.80**	**8.09**	**11.44**	**1.09**

Run 3 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.50	0.19	0.06	1.29
Initial Bias - span gas	246.61	11.77	11.73	23.52
Final Bias - Zero	0.53	0.17	0.04	1.35
Final Bias - span gas	246.51	11.73	11.69	24.35
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.01 %	0.09 %	0.09 %	2.52 %
Initial, bias gas	0.46 %	0.83 %	1.09 %	2.60 %
Final, zero gas	0.01 %	0.57 %	0.00 %	2.64 %
Final, bias gas	0.48 %	1.00 %	1.27 %	0.94 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.09 %	0.09 %	0.12 %
bias gas	0.02 %	0.17 %	0.17 %	1.66 %
Results				
Start/Stop Time	10:19 to 10:40			
Run 3 Average (raw data)	268.57	7.66	11.44	2.40
Drift corrected average	**270.74**	**7.76**	**11.71**	**1.19**

Run 4 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.53	0.17	0.04	1.35
Initial Bias - span gas	246.51	11.73	11.69	24.35
Final Bias - Zero	0.57	0.13	0.04	1.44
Final Bias - span gas	245.21	11.57	11.67	24.63
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.01 %	0.57 %	0.00 %	2.64 %
Initial, bias gas	0.48 %	1.00 %	1.27 %	0.94 %
Final, zero gas	0.00 %	0.39 %	0.00 %	2.82 %
Final, bias gas	0.74 %	1.70 %	1.35 %	0.38 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.17 %	0.00 %	0.18 %
bias gas	0.26 %	0.70 %	0.09 %	0.56 %
Results				
Start/Stop Time	11:12 to 11:33			
Run 4 Average (raw data)	266.85	7.71	11.35	3.62
Drift corrected average	**269.78**	**7.89**	**11.65**	**2.41**

Run 5 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.57	0.13	0.04	1.44
Initial Bias - span gas	245.21	11.57	11.67	24.63
Final Bias - Zero	0.57	0.18	0.06	1.95
Final Bias - span gas	245.43	11.48	11.62	24.56
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.39 %	0.00 %	2.82 %
Initial, bias gas	0.74 %	1.70 %	1.35 %	0.38 %
Final, zero gas	0.00 %	0.61 %	0.09 %	3.84 %
Final, bias gas	0.69 %	2.09 %	1.57 %	0.52 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.22 %	0.09 %	1.02 %
bias gas	0.04 %	0.39 %	0.22 %	0.14 %
Results				
Start/Stop Time	12:08 to 12:29			
Run 5 Average (raw data)	264.47	7.52	11.39	4.52
Drift corrected average	**267.95**	**7.77**	**11.73**	**3.09**

Run 6 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.57	0.18	0.06	1.95
Initial Bias - span gas	245.43	11.48	11.62	24.56
Final Bias - Zero	0.55	0.13	0.04	1.91
Final Bias - span gas	245.25	11.93	11.67	25.13
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.61 %	0.09 %	3.84 %
Initial, bias gas	0.69 %	2.09 %	1.57 %	0.52 %
Final, zero gas	0.00 %	0.39 %	0.00 %	3.76 %
Final, bias gas	0.73 %	0.13 %	1.35 %	0.62 %
Analyzer Drift (allowable = 3%)				
zero gas	0.00 %	0.22 %	0.09 %	0.08 %
bias gas	0.04 %	1.96 %	0.22 %	1.14 %
Results				
Start/Stop Time	12:58 to 13:19			
Run 6 Average (raw data)	264.83	7.80	11.45	5.13
Drift corrected average	**268.30**	**7.94**	**11.78**	**3.49**

Run 7 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.55	0.13	0.04	1.91
Initial Bias - span gas	245.25	11.93	11.67	25.13
Final Bias - Zero	-0.02	0.07	0.06	1.76
Final Bias - span gas	246.43	11.75	11.77	24.36
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.39 %	0.00 %	3.76 %
Initial, bias gas	0.73 %	0.13 %	1.35 %	0.62 %
Final, zero gas	0.12 %	0.13 %	0.09 %	3.46 %
Final, bias gas	0.49 %	0.92 %	0.92 %	0.92 %
Analyzer Drift (allowable = 3%)				
zero gas	0.11 %	0.26 %	0.09 %	0.30 %
bias gas	0.24 %	0.79 %	0.44 %	1.54 %
Results				
Start/Stop Time	13:44 to 14:05			
Run 7 Average (raw data)	262.22	7.60	11.56	5.76
Drift corrected average	**265.08**	**7.67**	**11.83**	**4.28**

Run 8 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	-0.02	0.07	0.06	1.76
Initial Bias - span gas	246.43	11.75	11.77	24.36
Final Bias - Zero	0.59	0.13	0.04	1.83
Final Bias - span gas	246.52	11.91	11.68	23.87
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.12 %	0.13 %	0.09 %	3.46 %
Initial, bias gas	0.49 %	0.92 %	0.92 %	0.92 %
Final, zero gas	0.00 %	0.39 %	0.00 %	3.60 %
Final, bias gas	0.47 %	0.22 %	1.31 %	1.90 %
Analyzer Drift (allowable = 3%)				
zero gas	0.12 %	0.26 %	0.09 %	0.14 %
bias gas	0.02 %	0.70 %	0.39 %	0.98 %
Results				
Start/Stop Time	14:30 to 14:51			
Run 8 Average (raw data)	260.31	7.70	11.49	6.07
Drift corrected average	**262.47**	**7.77**	**11.75**	**4.78**

Run 9 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-2
Project No.: 1501C
Date: 5/4/2015
Technician: Ed
Location: Vertical Stack

	NOx	O2	CO2	SO2
Bias Gas Value	248.51	12.00	11.99	25.00
Analyzer Readings				
Initial Bias - Zero	0.59	0.13	0.04	1.83
Initial Bias - span gas	246.52	11.91	11.68	23.87
Final Bias - Zero	0.53	0.11	0.04	1.76
Final Bias - span gas	247.41	11.80	11.71	24.13
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.39 %	0.00 %	3.60 %
Initial, bias gas	0.47 %	0.22 %	1.31 %	1.90 %
Final, zero gas	0.01 %	0.31 %	0.00 %	3.46 %
Final, bias gas	0.30 %	0.70 %	1.18 %	1.38 %
Analyzer Drift (allowable = 3%)				
zero gas	0.01 %	0.09 %	0.00 %	0.14 %
bias gas	0.18 %	0.48 %	0.13 %	0.52 %
Results				
Start/Stop Time	15:18 to 15:39			
Run 9 Average (raw data)	260.18	7.74	11.44	2.12
Drift corrected average	**261.84**	**7.80**	**11.72**	**0.36**

Run 1 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.05	0.32	0.20	0.04
Initial Bias - span gas	24.82	24.52	11.64	11.85
Final Bias - Zero	0.01	0.24	0.06	0.05
Final Bias - span gas	25.50	24.44	11.56	11.73

Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.00 %	0.55 %	0.09 %	0.13 %
Initial, bias gas	0.08 %	0.30 %	1.35 %	0.61 %
Final, zero gas	0.08 %	0.38 %	0.52 %	0.17 %
Final, bias gas	1.29 %	0.47 %	1.70 %	1.13 %

Analyzer Drift (allowable = 3%)				
zero gas	0.08 %	0.16 %	0.61 %	0.04 %
bias gas	1.37 %	0.16 %	0.35 %	0.52 %

Results				
Start/Stop Time	12:04 to 12:25			
Run 1 Average (raw data)	8.37	0.44	3.89	9.44
Drift corrected average	**8.24**	**0.16**	**3.94**	**9.59**

Run 2 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.01	0.24	0.06	0.05
Initial Bias - span gas	25.50	24.44	11.56	11.73
Final Bias - Zero	0.16	0.14	0.05	0.03
Final Bias - span gas	24.41	24.38	11.36	11.69
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.08 %	0.38 %	0.52 %	0.17 %
Initial, bias gas	1.29 %	0.47 %	1.70 %	1.13 %
Final, zero gas	0.22 %	0.18 %	0.57 %	0.09 %
Final, bias gas	0.91 %	0.59 %	2.57 %	1.31 %
Analyzer Drift (allowable = 3%)				
zero gas	0.30 %	0.20 %	0.04 %	0.09 %
bias gas	2.19 %	0.12 %	0.87 %	0.17 %
Results				
Start/Stop Time	12:52 to 13:13			
Run 2 Average (raw data)	8.30	0.09	4.01	9.45
Drift corrected average	**8.21**	**-0.10**	**4.16**	**9.67**

Run 3 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.16	0.14	0.05	0.03
Initial Bias - span gas	24.41	24.38	11.36	11.69
Final Bias - Zero	0.03	0.08	0.06	0.06
Final Bias - span gas	24.58	24.20	11.26	11.68
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.22 %	0.18 %	0.57 %	0.09 %
Initial, bias gas	0.91 %	0.59 %	2.57 %	1.31 %
Final, zero gas	0.04 %	0.20 %	0.52 %	0.22 %
Final, bias gas	0.56 %	0.95 %	3.01 %	1.35 %
Analyzer Drift (allowable = 3%)				
zero gas	0.26 %	0.12 %	0.04 %	0.13 %
bias gas	0.34 %	0.36 %	0.44 %	0.04 %
Results				
Start/Stop Time	13:44 to 14:05			
Run 3 Average (raw data)	8.31	0.04	3.91	9.43
Drift corrected average	**8.36**	**-0.07**	**4.11**	**9.67**

Run 4 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.03	0.08	0.06	0.06
Initial Bias - span gas	24.58	24.20	11.26	11.68
Final Bias - Zero	0.21	0.04	0.09	0.07
Final Bias - span gas	24.79	24.08	11.25	11.64
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.04 %	0.20 %	0.52 %	0.22 %
Initial, bias gas	0.56 %	0.95 %	3.01 %	1.35 %
Final, zero gas	0.32 %	0.28 %	0.39 %	0.26 %
Final, bias gas	0.14 %	1.20 %	3.05 %	1.53 %
Analyzer Drift (allowable = 3%)				
zero gas	0.36 %	0.08 %	0.13 %	0.04 %
bias gas	0.42 %	0.24 %	0.04 %	0.17 %
Results				
Start/Stop Time	14:26 to 14:47			
Run 4 Average (raw data)	8.56	0.04	3.89	9.41
Drift corrected average	**8.54**	**-0.02**	**4.10**	**9.67**

Run 5 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.21	0.04	0.09	0.07
Initial Bias - span gas	24.79	24.08	11.25	11.64
Final Bias - Zero	1.03	-0.01	0.05	0.06
Final Bias - span gas	24.71	23.87	11.25	11.64
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.32 %	0.28 %	0.39 %	0.26 %
Initial, bias gas	0.14 %	1.20 %	3.05 %	1.53 %
Final, zero gas	1.97 %	0.38 %	0.57 %	0.22 %
Final, bias gas	0.30 %	1.62 %	3.05 %	1.53 %
Analyzer Drift (allowable = 3%)				
zero gas	1.65 %	0.10 %	0.17 %	0.04 %
bias gas	0.16 %	0.43 %	0.00 %	0.00 %
Results				
Start/Stop Time	15:18 to 15:39			
Run 5 Average (raw data)	8.81	0.00	3.88	9.40
Drift corrected average	**8.43**	**-0.02**	**4.09**	**9.67**

Run 6 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	1.03	-0.01	0.05	0.06
Initial Bias - span gas	24.71	23.87	11.25	11.64
Final Bias - Zero	0.19	0.04	0.07	0.04
Final Bias - span gas	24.64	23.99	11.32	11.61
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	1.97 %	0.38 %	0.57 %	0.22 %
Initial, bias gas	0.30 %	1.62 %	3.05 %	1.53 %
Final, zero gas	0.28 %	0.28 %	0.48 %	0.13 %
Final, bias gas	0.44 %	1.38 %	2.75 %	1.66 %
Analyzer Drift (allowable = 3%)				
zero gas	1.69 %	0.10 %	0.09 %	0.09 %
bias gas	0.14 %	0.24 %	0.31 %	0.13 %
Results				
Start/Stop Time	16:03 to 16:24			
Run 6 Average (raw data)	9.30	-0.10	3.90	9.38
Drift corrected average	**8.98**	**-0.12**	**4.10**	**9.66**

Run 7 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.19	0.04	0.07	0.04
Initial Bias - span gas	24.64	23.99	11.32	11.61
Final Bias - Zero	0.01	0.05	0.07	0.05
Final Bias - span gas	24.49	24.06	11.32	11.62
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.28 %	0.28 %	0.48 %	0.13 %
Initial, bias gas	0.44 %	1.38 %	2.75 %	1.66 %
Final, zero gas	0.08 %	0.26 %	0.48 %	0.17 %
Final, bias gas	0.74 %	1.24 %	2.75 %	1.62 %
Analyzer Drift (allowable = 3%)				
zero gas	0.36 %	0.02 %	0.00 %	0.04 %
bias gas	0.30 %	0.14 %	0.00 %	0.04 %
Results				
Start/Stop Time	16:52 to 17:13			
Run 7 Average (raw data)	8.44	0.02	3.94	9.38
Drift corrected average	**8.47**	**-0.03**	**4.13**	**9.67**

Run 8 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	0.01	0.05	0.07	0.05
Initial Bias - span gas	24.49	24.06	11.32	11.62
Final Bias - Zero	-0.21	-0.07	0.03	0.05
Final Bias - span gas	24.17	24.02	11.36	11.61
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.08 %	0.26 %	0.48 %	0.17 %
Initial, bias gas	0.74 %	1.24 %	2.75 %	1.62 %
Final, zero gas	0.52 %	0.51 %	0.65 %	0.17 %
Final, bias gas	1.39 %	1.32 %	2.57 %	1.66 %
Analyzer Drift (allowable = 3%)				
zero gas	0.44 %	0.24 %	0.17 %	0.00 %
bias gas	0.64 %	0.08 %	0.17 %	0.04 %
Results				
Start/Stop Time	17:32 to 17:53			
Run 8 Average (raw data)	7.93	-0.12	3.93	9.37
Drift corrected average	**8.17**	**-0.12**	**4.12**	**9.66**

Run 9 Data Summary

Client: Solvay Chemicals
Facility: Green River
Process/Source: BO-4
Project No.: 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

	NOx	CO	O2	CO2
Bias Gas Value	24.85	24.68	12.00	11.99
Analyzer Readings				
Initial Bias - Zero	-0.21	-0.07	0.03	0.05
Initial Bias - span gas	24.17	24.02	11.36	11.61
Final Bias - Zero	-0.34	-0.17	0.07	0.05
Final Bias - span gas	24.08	23.81	11.44	11.62
Calculated Analyzer Bias (Allowable = 5%)				
Initial, zero gas	0.52 %	0.51 %	0.65 %	0.17 %
Initial, bias gas	1.39 %	1.32 %	2.57 %	1.66 %
Final, zero gas	0.78 %	0.71 %	0.48 %	0.17 %
Final, bias gas	1.57 %	1.74 %	2.23 %	1.62 %
Analyzer Drift (allowable = 3%)				
zero gas	0.26 %	0.20 %	0.17 %	0.00 %
bias gas	0.18 %	0.43 %	0.35 %	0.04 %
Results				
Start/Stop Time	18:14 to 18:35			
Run 9 Average (raw data)	8.22	-0.11	3.96	9.34
Drift corrected average	**8.65**	**0.01**	**4.14**	**9.63**

Company: Solvay Chemicals
Facility: Green River
Source: BO-1
Site: Vertical Stack
Parameter: Moisture

Date: 29-Apr-15
Job No.: 1501C
Meter Box No: M3
Meter Calibration (Y): 1.0000
Barometric Pressure: 23.80 in. Hg

EPA Method 4 Data for Runs: 1 and 2

Orifice Setting (DH):	0.850
Dry Gas Meter Leak Rates:	
0.002 cfm @ 10 in.Hg	Initial
0.002 cfm @ 6 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	775.7	853.7	78.0grams
2 / ~100 ml H2O	811.7	819.4	7.7grams
3 / Empty	659.2	660.4	1.2grams
4 / Silica Gel	898.1	906.5	8.4grams
		Total	95.3grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
14:40	364.514		
14:45	367.36	79	78
14:50	370.07	79	78
14:55	372.79	80	79
15:00	375.48	81	80
15:05	378.26	82	81
15:10	381.11	83	82
15:15	383.94	84	82
15:20	386.75	84	82
15:25	389.62	84	83
15:30	392.47	84	84
15:35	395.32	84	84
15:40	398.176	84	84
	33.662	82 F	

EPA Method 4 Data for Runs: 3 and 4

Orifice Setting (DH):	0.90
Dry Gas Meter Leak Rates:	
0.003 cfm @ 10 in.Hg	Initial
0.003 cfm @ 5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	853.7	938.6	84.9grams
2 / ~100 ml H2O	819.4	827.3	7.9grams
3 / Empty	660.4	663.0	2.6grams
4 / Silica Gel	906.5	914.2	7.7grams
		Total	103.1grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
16:48	398.452		
16:53	401.41	88	88
16:58	404.41	88	89
17:03	407.40	88	88
17:08	410.39	88	88
17:13	413.36	88	88
17:18	416.30	88	89
17:23	419.28	89	89
17:28	422.260	90	89
17:33	425.180	89	89
17:38	428.29	89	89
17:43	431.41	90	89
17:48	434.501	89	89
	36.049	89 F	

EPA Method 4 Data for Runs: 5 and 6

30-Apr-15

Orifice Setting (DH):	0.90
Dry Gas Meter Leak Rates:	
0.004 cfm @ 12 in.Hg	Initial
0.002 cfm @ 6 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	938.6	946.1	7.5grams
2 / ~100 ml H2O	827.3	913.3	86.0grams
3 / Empty	663.0	661.9	-1.1grams
4 / Silica Gel	914.2	920.0	5.8grams
		Total	98.2grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
9:10	434.652		
9:15	437.68	63	63
9:20	440.66	63	63
9:25	446.63	65	64
9:30	446.60	67	64
9:35	449.58	67	65
9:40	452.52	67	65
9:45	455.48	66	64
9:50	458.43	67	64
9:55	461.40	67	65
10:00	464.38	68	65
10:05	467.35	67	64
10:10	470.390	67	65
	35.738	65 F	

Company: Solvay Chemicals **Date: 29-Apr-15**

Facility: Green River Job No.: 1501C

Source: BO-1 Pitot Tube No: V-9-1

Site: Vertical Stack Pitot Tube Cp: 0.840

Parameter: Velocity/Temp. Stack Area: 41.164 sq.ft.

Start Times	14:40		15:12		16:40	
Static Pressure	-0.12 in. H20		-0.12 in. H20		-0.15 in. H20	
Ps	23.79 in. Hg		23.79 in. Hg		23.79 in. Hg	
	Run 1		**Run 2**		**Run 3**	
	Velocity	Stack	Velocity	Stack	Velocity	Stack
Traverse Point	Head (Δp)	Temp.	Head (Δp)	Temp.	Head (Δp)	Temp.
A1	0.34	118	0.38	119	0.35	120
2	0.37	118	0.40	120	0.39	119
3	0.38	118	0.42	119	0.42	119
4	0.37	118	0.39	119	0.41	119
5	0.35	119	0.34	119	0.45	119
6	0.35	119	0.33	119	0.41	119
7	0.32	119	0.31	119	0.40	119
8	0.28	119	0.26	119	0.29	119
B1	0.30	119	0.33	119	0.38	119
2	0.32	119	0.32	119	0.40	120
3	0.31	119	0.37	119	0.42	120
4	0.37	119	0.42	119	0.42	120
5	0.38	119	0.40	119	0.38	120
6	0.35	119	0.41	119	0.39	119
7	0.34	119	0.37	119	0.34	119
8	0.28	119	0.31	118	0.26	119
Avg. Temp		119		119		119
Avg. Δp	0.5808		0.5988		0.6166	

Date: 30-Apr-15

Start Times	17:40		9:05		10:31	
Static Pressure	-0.15 in. H20		-0.10 in. H20		-0.10 in. H20	
Ps	23.79 in. Hg		23.79 in. Hg		23.79 in. Hg	
	Run 4		**Run 5**		**Run 6**	
	Velocity	Stack	Velocity	Stack	Velocity	Stack
Traverse Point		Temp.	Head (Δp)	Temp.	Head (Δp)	Temp.
A1	0.34	119	0.35	119	0.33	120
2	0.40	119	0.36	119	0.40	120
3	0.41	119	0.42	120	0.42	120
4	0.39	119	0.46	120	0.43	120
5	0.38	119	0.43	120	0.44	120
6	0.37	119	0.44	120	0.46	120
7	0.37	119	0.43	120	0.43	120
8	0.28	119	0.34	120	0.35	120
B1	0.39	119	0.38	119	0.38	119
2	0.41	119	0.42	119	0.44	119
3	0.42	119	0.42	119	0.45	119
4	0.36	119	0.44	120	0.44	120
5	0.38	119	0.38	120	0.38	120
6	0.39	119	0.38	120	0.40	120
7	0.34	118	0.36	120	0.36	120
8	0.30	118	0.22	119	0.28	119
Avg. Temp		119		120		120
Avg. $\sqrt{\Delta p}$	0.6079		0.6221		0.6307	

Company: Solvay Chemicals
Facility: Green River
Source: BO-1
Site: Vertical Stack
Parameter: Moisture

Date: 29-Apr-15
Job No.: 1501C
Meter Box No: M3
Meter Calibration (Y): 1.0000
Barometric Pressure: 23.80 in. Hg

EPA Method 4 Data for Runs: 7 and 8

Orifice Setting (ΔH):	0.91	
Dry Gas Meter Leak Rates:		
0.000 cfm @	11 in.Hg	Initial
0.002 cfm @	5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	743.6	826.8	83.2grams
2 / ~100 ml H2O	808.2	817.8	9.6grams
3 / Empty	661.9	663.7	1.8grams
4 / Silica Gel	920.0	926.9	6.9grams
		Total	101.5grams

Clock Time	Dry Gas Meter	Gas Meter Temp.	
		Inlet	Outlet
11:55	471.000		
12:00	474.06	69	68
12:05	477.05	68	68
12:10	480.05	68	68
12:15	483.02	69	68
12:20	486.07	70	69
12:25	489.11	70	69
12:30	492.13	70	69
12:35	495.14	71	70
12:40	498.12	71	70
12:45	501.09	70	70
12:50	504.07	70	70
12:55	507.020	71	71
	36.020 ft3	69 F	

EPA Method 4 Data for Runs: 9

Orifice Setting (ΔH):	1.80	
Dry Gas Meter Leak Rates:		
0.000 cfm @	6 in.Hg	Initial
0.002 cfm @	6 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	826.8	899.3	72.5grams
2 / ~100 ml H2O	817.8	828.8	11.0grams
3 / Empty	663.7	664.4	0.7grams
4 / Silica Gel	926.9	931.6	4.7grams
		Total	88.9grams

Clock Time	Dry Gas Meter	Gas Meter Temp.	
		Inlet	Outlet
13:50	507.301		
13:55	511.24	71	70
14:00	515.10	71	71
14:05	519.02	72	72
14:10	523.00	72	72
14:15	526.96	72	72
14:20	530.92	72	72
14:25	534.84	72	72
14:30	538.81	72	72
	31.509 ft3	72 F	

Optimal Air Testing

Company: Solvay Chemicals **Date: 29-Apr-15**

Facility: Green River Job No.: 1501C

Source: BO-1 Pitot Tube No: V-9-1

Site: Vertical Stack Pitot Tube Cp: 0.840 sq.ft.

Parameter: Velocity/Temp. Stack Area: 41.164 sq.ft.

Start Times	11:40		12:51		13:32	
Static Pressure	-0.08 in. H20		-0.08 in. H20		-0.09 in. H20	
Ps	23.79 in. Hg		23.79 in. Hg		23.79 in. Hg	
	Run 7		**Run 8**		**Run 9**	
Traverse Point	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.
A1	0.34	120	0.31	119	0.30	120
2	0.37	120	0.38	119	0.36	120
3	0.40	120	0.38	119	0.37	120
4	0.39	120	0.37	119	0.39	120
5	0.40	120	0.41	120	0.37	120
6	0.43	120	0.41	120	0.38	120
7	0.40	120	0.39	119	0.34	120
8	0.33	120	0.34	119	0.33	120
B1	0.38	120	0.33	120	0.32	120
2	0.41	121	0.41	120	0.37	120
3	0.43	121	0.42	120	0.38	120
4	0.43	121	0.42	120	0.37	120
5	0.38	120	0.37	120	0.34	120
6	0.39	120	0.36	120	0.34	120
7	0.35	121	0.36	120	0.31	119
8	0.27	120	0.26	120	0.25	119
Avg. Temp		120		120		120
Avg. $\sqrt{\Delta p}$	0.6165		0.6072		0.5892	

Company: Solvay Chemicals
Facility: Green River
Source: BO-2
Site: Vertical Stack
Parameter: Moisture

Date: 4-May-15
Job No.: 1501C
Meter Box No: M4
Meter Calibration (Y): 1.0160
Barometric Pressure: 23.74 in. Hg

EPA Method 4 Data for Runs: 1 and 2

Orifice Setting (DH):	0.900
Dry Gas Meter Leak Rates:	
0.004 cfm @ 10 in.Hg	Initial
0.002 cfm @ 5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	766.1	831.1	65.0grams
2 / ~100 ml H2O	800.8	811.6	10.8grams
3 / Empty	664.6	667.1	2.5grams
4 / Silica Gel	930.0	937.8	7.8grams
		Total	86.1grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
10:15	401.327		
10:20	404.35	61	60
10:25	407.28	61	61
10:30	410.23	62	61
10:35	413.19	62	62
10:40	416.14	63	62
10:45	419.10	65	63
10:50	422.08	66	64
10:55	425.12	67	63
11:00	428.15	68	65
11:05	431.15	68	65
11:10	434.24	68	66
11:15	437.334	70	66
	36.007	64 F	

EPA Method 4 Data for Runs: 3 and 4

Orifice Setting (ΔH):	0.90
Dry Gas Meter Leak Rates:	
0.004 cfm @ 8 in.Hg	Initial
0.002 cfm @ 5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	831.1	912.3	81.2grams
2 / ~100 ml H2O	811.6	822.4	10.8grams
3 / Empty	667.1	669.1	2.0grams
4 / Silica Gel	937.8	944.1	6.3grams
		Total	100.3grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
11:50	437.397		
11:55	441.31	70	70
12:00	444.28	71	70
12:05	447.34	71	70
12:10	450.35	71	71
12:15	453.35	72	71
12:20	456.46	72	71
12:25	459.46	73	71
12:30	462.470	73	72
12:35	465.430	72	71
12:40	468.36	73	72
12:45	471.28	74	72
12:50	474.189	74	72
	36.792	72 F	

EPA Method 4 Data for Runs: 5 and 6

Orifice Setting (ΔH):	0.90
Dry Gas Meter Leak Rates:	
0.004 cfm @ 7 in.Hg	Initial
0.004 cfm @ 7 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	912.3	950.1	37.8grams
2 / ~100 ml H2O	822.4	868.4	46.0grams
3 / Empty	669.1	670.8	1.7grams
4 / Silica Gel	944.1	950.5	6.4grams
		Total	91.9grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
13:34	474.250		
13:39	477.25	72	72
13:44	480.24	72	72
13:49	483.23	72	72
13:54	486.23	72	72
13:59	489.21	73	73
14:04	492.25	73	73
14:09	495.29	73	73
14:14	498.31	74	72
14:19	501.34	74	73
14:24	504.35	75	73
14:29	507.34	75	73
14:34	510.360	76	74
	36.110	73 F	

Company: Solvay Chemicals **Date: 4-May-15**

Facility: Green River Job No.: 1501C

Source: BO-2 Pitot Tube No: V-9-1

Site: Vertical Stack Pitot Tube Cp: 0.840

Parameter: Velocity/Temp. Stack Area: 40.456 sq.ft.

Start Times	10:00		10:43		11:40	
Static Pressure	0.11 in. H20		0.11 in. H20		0.12 in. H20	
Ps	23.75 in. Hg		23.75 in. Hg		23.75 in. Hg	
	Run 1		**Run 2**		**Run 3**	
	Velocity	Stack	Velocity	Stack	Velocity	Stack
Traverse Point	Head (Δp)	Temp.	Head (Δp)	Temp.	Head (Δp)	Temp.
Port A, Point 6	0.34	114	0.35	114	0.36	115
5	0.42	114	0.48	114	0.45	115
4	0.63	115	0.49	114	0.51	115
3	0.46	115	0.50	114	0.52	116
2	0.40	115	0.45	114	0.47	116
1	0.35	114	0.39	114	0.38	116
Port B, Point 1	0.30	114	0.34	114	0.37	115
2	0.41	114	0.45	115	0.40	115
3	0.47	114	0.47	115	0.52	115
4	0.48	114	0.49	114	0.50	115
5	0.41	114	0.44	114	0.46	115
6	0.35	114	0.37	114	0.37	116
Avg. Temp		114		114		115
Avg. Δp	0.6438		0.6582		0.6636	

Start Times	12:31		13:26		14:18	
Static Pressure	0.12 in. H20		0.05 in. H20		0.05 in. H20	
Ps	23.75 in. Hg		23.74 in. Hg		23.74 in. Hg	
	Run 4		**Run 5**		**Run 6**	
	Velocity	Stack	Velocity	Stack	Velocity	Stack
Traverse Point	Head (Δp)	Temp.	Head (Δp)	Temp.	Head (Δp)	Temp.
A1	0.37	115	0.36	115	0.35	116
2	0.46	115	0.47	116	0.46	116
3	0.52	115	0.50	115	0.50	116
4	0.52	115	0.51	115	0.51	116
5	0.48	115	0.46	115	0.47	116
6	0.39	115	0.36	115	0.35	115
B1	0.37	115	0.34	116	0.34	115
2	0.48	115	0.42	116	0.45	115
3	0.53	115	0.50	116	0.48	116
4	0.54	115	0.51	116	0.46	116
5	0.50	115	0.48	116	0.42	116
6	0.36	115	0.35	115	0.33	116
Avg. Temp		115		116		116
Avg. $\sqrt{\Delta p}$	0.6764		0.6602		0.6513	

Company: Solvay Chemicals
Facility: Green River
Source: BO-2
Site: Vertical Stack
Parameter: Moisture

Date: 4-May-15
Job No.: 1501C
Meter Box No: M4
Meter Calibration (Y): 1.0160
Barometric Pressure: 23.74 in. Hg

EPA Method 4 Data for Runs: 7 and 8

Orifice Setting (ΔH): 0.90	
Dry Gas Meter Leak Rates:	
0.004 cfm @ 7 in.Hg	Initial
0.002 cfm @ 7 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	779.9	893.6	113.7grams
2 / ~100 ml H2O	868.4	841.4	-27.0grams
3 / Empty	670.8	671.4	0.6grams
4 / Silica Gel	950.5	956.3	5.8grams
		Total	93.1grams

Clock Time	Dry Gas Meter	Gas Meter Temp.	
		Inlet	Outlet
15:12	510.457		
15:17	513.46	75	75
15:22	516.43	75	75
15:27	519.45	75	75
15:32	522.44	75	75
15:37	525.42	76	75
15:42	528.40	77	75
15:47	531.39	77	76
15:52	534.39	78	76
15:57	537.39	78	77
16:02	540.37	79	77
16:07	543.36	79	78
16:12	546.358	79	78
	35.901 ft3	76 F	

EPA Method 4 Data for Run: 9

Orifice Setting (ΔH): 1.70	
Dry Gas Meter Leak Rates:	
0.004 cfm @ 9 in.Hg	Initial
0.003 cfm @ 7 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	893.6	894.0	0.4grams
2 / ~100 ml H2O	841.4	917.7	76.3grams
3 / Empty	671.4	672.6	1.2grams
4 / Silica Gel	956.3	962.0	5.7grams
		Total	83.6grams

Clock Time	Dry Gas Meter	Gas Meter Temp.	
		Inlet	Outlet
16:19	546.480		
16:24	550.52	77	77
16:29	554.49	77	77
16:34	558.55	77	77
16:39	562.60	77	77
16:44	566.66	78	77
16:49	570.71	79	77
16:54	574.88	79	77
16:59	578.86	79	77
	32.380 ft3	77 F	

Optimal Air Testing

Company: Solvay Chemicals — **Date: 4-May-15**

Facility: Green River — Job No.: 1501C

Source: BO-2 — Pitot Tube No: V-9-1

Site: Vertical Stack — Pitot Tube Cp: 0.840 sq.ft.

Parameter: Velocity/Temp. — Stack Area: 40.456 sq.ft.

	Run 7		Run 8		Run 9	
Start Times	15:07		15:50		13:32	
Static Pressure	0.10 in. H20		0.10 in. H20		-0.09 in. H20	
Ps	23.75 in. Hg		23.75 in. Hg		23.73 in. Hg	
Traverse Point	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.
A1	0.38	115	0.35	115	0.34	115
2	0.48	115	0.47	115	0.44	115
3	0.51	115	0.53	115	0.51	115
4	0.50	115	0.53	115	0.52	115
5	0.45	115	0.47	115	0.48	115
6	0.36	115	0.36	115	0.38	115
B1	0.39	116	0.35	115	0.38	115
2	0.48	115	0.47	115	0.46	116
3	0.52	116	0.48	115	0.46	116
4	0.49	116	0.50	115	0.50	116
5	0.44	116	0.47	115	0.46	115
6	0.34	115	0.38	115	0.36	116
Avg. Temp		115		115		115
Avg.$\sqrt{\Delta p}$	0.6655		0.6665		0.6688	

Company: Solvay Chemicals Optimal Air Testing
Date: 4/28/15
Facility: Green River
Job No.: 1501C
Source: BO-4
Meter Box No: #2
Site: Stack
Meter Calibration (Y): 1.000
Parameter: Moisture
Barometric Pressure: 23.85 in. Hg

EPA Method 4 Data for Runs: 1 and 2

Orifice Setting (ΔH): 0.85	
Dry Gas Meter Post Leak Rates:	
0.002 cfm @ 7 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	846.8	886.7	39.9grams
2 / ~100 ml H2O	771.2	836.2	65.0grams
3 / Empty	665.2	665.5	0.3grams
4 / Silica Gel	901.3	906.5	5.2grams
		Total	110.4grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
13:26	597.487		
13:31	600.470	79	78
13:36	603.450	79	79
13:41	606.430	80	80
13:46	609.400	82	81
13:51	612.380	83	82
13:56	615.350	84	83
14:01	618.310	85	84
14:06	621.270	85	84
14:11	624.220	86	84
14:16	627.180	87	85
14:21	630.160	87	86
14:26	633.150	87	85
	35.663	83 F	

Water Vapor Sampled, Vwstd 5.20 *Gas Sampled, Vmstd 27.70* *Moisture Concentration, Bw 15.80*

EPA Method 4 Data for Runs: 3 and 4

Orifice Setting (ΔH): 0.85	
Dry Gas Meter Post Leak Rates:	
0.002 cfm @ 5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	886.7	982.2	95.5grams
2 / ~100 ml H2O	836.2	845.7	9.5grams
3 / Empty	665.5	667.9	2.4grams
4 / Silica Gel	906.5	912.9	6.4grams
		Total	113.8grams

Clock Time	Dry Gas Meter	Gas Meter Temp.	
		Inlet	Outlet
14:46	633.683		
14:51	636.690	89	89
14:56	639.700	89	89
15:01	642.710	89	89
15:06	645.700	89	89
15:11	648.620	89	89
15:16	651.640	90	89
15:21	654.600	91	89
15:26	657.690	90	89
15:31	660.770	92	90
15:36	663.690	93	91
15:41	666.680	94	91
15:46	669.690	94	91
	36.007	90 F	

Water Vapor Sampled, Vwstd 5.36 *Gas Sampled, Vmstd 27.61* *Moisture Concentration, Bw 16.25*

EPA Method 4 Data for Runs: 5 and 6

Orifice Setting (ΔH): 0.85	
Dry Gas Meter Post Leak Rates:	
0.001 cfm @ 5 in.Hg	Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	775.6	872.2	96.6grams
2 / ~100 ml H2O	783.9	792.5	8.6grams
3 / Empty	667.9	667.9	0.0grams
4 / Silica Gel	912.9	919.6	6.7grams
		Total	111.9grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
16:33	669.800		
16:38	672.850	95	92
16:43	675.850	92	92
16:48	678.850	92	92
16:53	681.840	93	92
16:58	684.840	93	92
17:03	687.840	94	92
17:08	690.830	94	92
17:13	693.830	95	93
17:18	696.830	95	93
17:23	699.830	95	93
17:28	702.870	95	94
17:33	705.870	96	94
	36.070	93 F	

Water Vapor Sampled, Vwstd 5.27 *Gas Sampled, Vmstd 27.50* *Moisture Concentration, Bw 16.08*

Optimal Air Testing

Company: Solvay Chemicals **Date: 28-Apr-15**

Facility: Green River Job No.: 1501C

Source: BO-4 Pitot Tube No: V-9-1

Site: Stack Pitot Tube Cp: 0.840

Parameter: Velocity/Temp. Stack Area: 28.23 sq.ft.

Start Times	13:13		14:05		14:55	
Static Pressure	-0.09 in. H20		-0.09 in. H20		-0.10 in. H20	
Ps	23.84 in. Hg		23.84 in. Hg		23.84 in. Hg	
	Run 1		**Run 2**		**Run 3**	
Traverse Point	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.
A6	0.39	324	0.33	328	0.32	324
A5	0.40	325	0.35	331	0.35	327
A4	0.42	329	0.41	333	0.40	329
A3	0.42	330	0.48	336	0.50	331
A2	0.40	328	0.46	332	0.45	330
A1	0.27	327	0.39	327	0.36	324
B6	0.35	330	0.38	329	0.36	325
B5	0.37	328	0.42	332	0.40	329
B4	0.39	329	0.44	333	0.42	331
B3	0.50	329	0.42	332	0.43	330
B2	0.46	331	0.40	330	0.35	326
B1	0.37	328	0.31	322	0.30	320
Avg. Temp		328		330		327
Avg. $\sqrt{\Delta p}$	0.627		0.6306		0.620	

Start Times			16:25		17:11	
Static Pressure	-0.10 in. H20		-0.10 in. H20		-0.10 in. H20	
Ps	23.84 in. Hg		23.84 in. Hg		23.84 in. Hg	
	Run 4		**Run 5**		**Run 6**	
Traverse Point	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.
A6	0.32	324	0.30	328	0.32	328
A5	0.36	324	0.41	328	0.40	329
A4	0.39	327	0.39	331	0.40	332
A3	0.48	330	0.51	333	0.54	335
A2	0.46	331	0.48	333	0.49	332
A1	0.39	331	0.33	324	0.34	328
B6	0.34	324	0.36	329	0.40	327
B5	0.39	327	0.40	330	0.45	331
B4	0.44	329	0.44	334	0.42	334
B3	0.46	331	0.50	332	0.52	332
B2	0.49	331	0.53	329	0.46	330
B1	0.25	328	0.27	312	0.31	325
Avg. Temp		328		329		330
Avg. $\sqrt{\Delta p}$	0.628		0.637		0.646	

Company: Solvay Chemicals **Optimal Air Testing** **Date: 28-Apr-15**

Facility: Green River Job No.: **1501C**

Source: BO-4 Meter Box No: **2**

Site: Stack Meter Calibration (Y): **1.000**

Parameter: Moisture Barometric Pressure: **23.84 in. Hg**

EPA Method 4 Data for Runs: 7 and 8

Orifice Setting (ΔH): 0.85
Dry Gas Meter Post Leak Rates:
0.001 cfm @ 5 in.Hg Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	766.2	864.4	98.2grams
2 / ~100 ml H2O	792.5	800.3	7.8grams
3 / Empty	667.9	668.5	0.6grams
4 / Silica Gel	919.6	925.9	6.3grams
		Total	112.9grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
18:08	706.117		
18:13	709.13	90	89
18:18	712.14	89	89
18:23	715.16	89	89
18:28	718.13	90	89
18:33	721.12	91	90
18:38	724.01	93	91
18:43	727.17	92	91
18:48	730.16	93	91
18:53	733.18	92	91
18:58	736.26	93	91
19:03	739.28	93	92
19:08	742.255	93	91
	36.138 ft3	91 F	

Water Vapor Sampled, Vwstd 5.31 *as Sampled; Vmstd 27.66* *Moisture Concentration, Bw 16.12*

EPA Method 4 Data for Run: 9

Orifice Setting (ΔH): 1.80
Dry Gas Meter Post Leak Rates:
0.001 cfm @ 5 in.Hg Post-Test

Moisture Sampling Train			
Fraction / Contents	Initial Wt.	Final Wt.	Condensate:
1 / ~100 ml H2O	757.1	837.6	80.5grams
2 / ~100 ml H2O	800.3	812.3	12.0grams
3 / Empty	668.8	670.4	1.6grams
4 / Silica Gel	925.9	931.8	5.9grams
		Total	100.0grams

Clock Time	Dry Gas Meter	Dry Gas Meter Temp.	
		Inlet	Outlet
19:20	742.493		
19:25	746.91	89	88
19:30	751.37	88	87
19:35	755.81	88	87
19:40	760.23	87	87
19:45	764.68	87	87
19:50	769.01	87	87
19:55	773.300	87	87
20:00			
20:05			
20:10			
20:15			
20:20			
	30.807 ft3	87 F	

Water Vapor Sampled, Vwstd 4.71 *as Sampled, Vmstd 23.80* *Moisture Concentration, Bw 16.51*

Optimal Air Testing

Company: Solvay Chemicals **Date: 28-Apr-15**

Facility: Green River Job No.: 1501C

Source: BO-4 Pitot Tube No: V-9-1

Site: Stack Pitot Tube Cp: 0.84

Parameter: Velocity/Temp. Stack Area: 28.23 sq.ft.

Start Times	17:58		18:41		19:20	
Static Pressure	-0.10 in. H20		-0.10 in. H20		-0.10 in. H20	
Ps	23.84 in. Hg		23.84 in. Hg		23.84 in. Hg	
	Run 7		**Run 8**		**Run 9**	
Traverse Point	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.	Velocity Head (Δp)	Stack Temp.
A6	0.37	321	0.30	324	0.33	324
A5	0.47	328	0.36	328	0.38	325
A4	0.48	331	0.41	331	0.40	330
A3	0.41	333	0.51	333	0.50	333
A2	0.36	331	0.49	332	0.49	334
A1	0.30	326	0.39	324	0.40	329
B6	0.36	327	0.37	326	0.37	324
B5	0.41	332	0.40	329	0.40	326
B4	0.44	333	0.43	331	0.43	332
B3	0.46	333	0.44	330	0.45	333
B2	0.50	328	0.41	324	0.44	332
B1	0.26	322	0.30	321	0.35	330
Avg. Temp		329		328		329
Avg. Δp	0.6311		0.6312		0.6404	

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APPENDIX E

Reference Method CEM Calibrations

BO-1 RATA
Direct Analyzer Calibations

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/29/2015	11:40:03	26.04	0.02	0.01	0.08	
4/29/2015	11:41:03	0.18	0.02	0.02	0.03	Zero
4/29/2015	11:42:03	0.18	0.02	0.01	24.60	
4/29/2015	11:43:03	304.35	0.02	0.01	104.85	
4/29/2015	11:44:03	462.04	0.01	0.02	104.86	
4/29/2015	11:45:03	501.93	0.00	0.01	104.84	
4/29/2015	11:46:03	502.25	0.00	0.02	104.83	High NOx (501.70 ppm)
4/29/2015	11:47:03	494.86	0.00	0.02	104.86	
4/29/2015	11:48:03	265.90	0.00	0.01	104.85	
4/29/2015	11:49:03	249.12	0.00	0.02	104.86	
4/29/2015	11:50:03	247.94	0.00	0.01	104.84	Mid NOx (248.51 ppm)
4/29/2015	11:51:03	175.25	0.01	0.01	77.78	
4/29/2015	11:52:03	47.84	0.00	0.01	50.26	
4/29/2015	11:53:03	47.87	0.00	0.02	50.27	
4/29/2015	11:54:03	47.92	-0.01	0.02	50.11	
4/29/2015	11:55:03	47.93	-0.01	0.01	50.18	
4/29/2015	11:56:03	47.94	0.00	0.01	50.11	
4/29/2015	11:57:03	47.91	-0.01	0.01	50.09	
4/29/2015	11:58:03	47.90	-0.01	0.01	50.03	High SO2 (50.00 ppm)
4/29/2015	11:59:03	55.26	0.00	0.01	52.02	
4/29/2015	12:00:03	22.72	-0.01	0.01	23.97	
4/29/2015	12:01:03	22.65	-0.01	0.02	23.97	
4/29/2015	12:02:03	22.97	-0.01	0.01	24.21	
4/29/2015	12:03:03	21.90	-0.01	0.02	23.54	
4/29/2015	12:04:03	23.89	-0.01	0.01	24.69	
4/29/2015	12:05:03	23.87	0.00	0.01	24.71	Mid SO2 (25.00 ppm)
4/29/2015	12:06:03	23.95	0.00	0.03	69.26	
4/29/2015	12:07:03	32.35	1.35	2.36	76.24	
4/29/2015	12:08:03	16.08	19.96	22.50	0.19	
4/29/2015	12:09:03	0.17	21.06	22.58	-0.15	
4/29/2015	12:10:03	0.56	21.23	22.60	-0.21	
4/29/2015	12:11:03	0.43	21.31	22.61	-0.24	
4/29/2015	12:12:03	0.18	21.35	22.80	-0.28	
4/29/2015	12:13:03	0.19	21.38	22.90	-0.25	
4/29/2015	12:14:03	0.20	21.87	22.91	-0.29	
4/29/2015	12:15:03	0.18	22.92	22.92	-0.29	
4/29/2015	12:16:03	0.17	22.91	22.92	-0.30	High O2/CO2 (22.92/22.91 %)
4/29/2015	12:17:03	1.10	19.89	18.46	2.04	
4/29/2015	12:18:03	0.30	12.21	11.78	-0.01	
4/29/2015	12:19:03	0.14	12.02	11.77	-0.27	
4/29/2015	12:20:03	0.20	11.96	11.77	-0.29	
4/29/2015	12:21:03	0.16	11.92	11.76	-0.30	
4/29/2015	12:22:03	1.67	11.91	11.79	-0.29	Mid O2/CO2 (11.96/11.98 %)
4/29/2015	12:23:03	103.98	9.41	12.21	0.76	

Initial System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/29/2015	13:00:03	0.21	0.18	0.03	21.14	
4/29/2015	13:01:03	0.21	0.16	0.05	-0.08	Zero
4/29/2015	13:02:03	153.68	1.96	3.15	14.63	
4/29/2015	13:03:03	237.98	0.18	0.04	103.19	
4/29/2015	13:04:03	238.15	0.14	0.03	104.84	
4/29/2015	13:05:03	246.83	0.13	0.03	104.83	
4/29/2015	13:06:03	248.52	0.11	0.03	104.84	Nox Span (248.51 ppm)
4/29/2015	13:07:03	206.46	0.11	0.03	103.78	
4/29/2015	13:08:03	25.55	0.10	0.03	56.15	
4/29/2015	13:09:03	24.47	0.10	0.03	34.64	
4/29/2015	13:10:03	24.32	0.08	0.03	28.48	
4/29/2015	13:11:03	24.06	0.07	0.03	26.28	
4/29/2015	13:12:03	24.08	0.07	0.03	24.92	
4/29/2015	13:13:03	24.09	0.06	0.03	23.89	
4/29/2015	13:14:03	24.61	0.07	0.03	23.44	
4/29/2015	13:15:03	24.83	0.06	0.03	23.48	SO2 Span (25.00 ppm)
4/29/2015	13:16:03	45.01	1.53	2.75	25.20	
4/29/2015	13:17:03	11.63	10.49	11.49	21.38	
4/29/2015	13:18:03	0.23	10.95	11.58	11.02	
4/29/2015	13:19:03	0.47	11.03	11.60	7.28	
4/29/2015	13:20:03	0.25	11.05	11.61	4.88	
4/29/2015	13:21:03	0.24	11.07	11.61	3.68	
4/29/2015	13:22:03	0.23	11.08	11.61	2.80	O2/CO2 Span (11.96/11.98 %)
4/29/2015	13:23:03	47.39	9.67	11.85	2.88	

End Run 1 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/29/2015	14:28:13	27.50	0.06	0.01	22.39	
4/29/2015	14:29:13	112.60	2.63	6.49	24.39	SO2 Span (25.00 ppm)
4/29/2015	14:30:13	242.30	5.81	12.14	20.75	
4/29/2015	14:31:13	248.35	6.00	12.09	12.70	
4/29/2015	14:32:13	249.51	5.95	12.13	9.53	Nox Span (248.51 ppm)
4/29/2015	14:33:13	135.37	6.70	7.73	7.12	
4/29/2015	14:34:13	2.11	10.75	11.57	6.41	
4/29/2015	14:35:13	1.66	10.89	11.58	3.72	
4/29/2015	14:36:13	1.65	10.96	11.59	2.38	
4/29/2015	14:37:13	1.57	11.12	11.59	1.42	
4/29/2015	14:38:13	1.58	11.15	11.60	1.08	
4/29/2015	14:39:13	1.56	11.17	11.60	0.58	O2/CO2 Span (11.96/11.98 %)
4/29/2015	14:40:13	20.43	5.64	4.79	0.82	
4/29/2015	14:41:13	1.99	0.42	0.10	1.32	
4/29/2015	14:42:13	1.81	0.25	0.06	1.17	
4/29/2015	14:43:13	1.85	0.18	0.05	0.91	
4/29/2015	14:44:13	1.71	0.15	0.04	0.73	Zero
4/29/2015	14:45:13	175.07	3.45	10.92	1.27	

End Run 2 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]
4/29/2015	15:13:13	250.56	0.22	0.06	104.84

4/29/2015	15:14:13	250.14	0.17	0.05	104.84	Nox Span (248.51 ppm)
4/29/2015	15:15:13	237.35	0.14	0.04	104.60	
4/29/2015	15:16:13	27.11	0.12	0.03	50.84	
4/29/2015	15:17:13	18.99	0.11	0.03	28.45	
4/29/2015	15:18:13	18.62	0.10	0.03	23.26	
4/29/2015	15:19:13	20.57	0.09	0.03	22.30	
4/29/2015	15:20:13	26.23	0.09	0.03	22.88	
4/29/2015	15:21:13	26.49	0.08	0.03	23.02	
4/29/2015	15:22:13	27.69	0.08	0.03	23.92	
4/29/2015	15:23:13	27.74	0.07	0.01	24.12	SO2 Span (25.00 ppm)
4/29/2015	15:24:13	27.70	0.07	0.01	23.86	
4/29/2015	15:25:13	56.44	5.20	6.98	25.25	
4/29/2015	15:26:13	0.96	11.51	11.56	13.08	
4/29/2015	15:27:13	0.59	11.69	11.59	6.13	
4/29/2015	15:28:13	0.22	11.75	11.61	4.42	
4/29/2015	15:29:13	0.73	11.79	11.62	2.59	O2/CO2 Span (11.96/11.98 %)
4/29/2015	15:30:13	18.47	9.51	8.62	2.49	
4/29/2015	15:31:13	2.82	0.58	0.13	3.06	
4/29/2015	15:32:13	0.92	0.25	0.07	2.49	
4/29/2015	15:33:13	0.93	0.16	0.05	2.35	
4/29/2015	15:34:13	0.80	0.12	0.03	0.37	Zero
4/29/2015	15:35:13	158.12	4.16	9.15	0.36	

End Run 3 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/29/2015	15:45:33	249.25	0.18	0.05	104.84	
4/29/2015	15:46:33	249.23	0.14	0.04	104.81	Nox Span (248.51 ppm)
4/29/2015	15:47:33	249.23	0.11	0.03	104.83	
4/29/2015	15:48:33	154.29	0.10	0.03	94.52	
4/29/2015	15:49:33	26.23	0.09	0.03	46.45	
4/29/2015	15:50:33	25.65	0.08	0.02	34.61	
4/29/2015	15:51:33	25.54	0.07	0.01	30.63	
4/29/2015	15:52:33	25.53	0.07	0.01	27.71	
4/29/2015	15:53:33	25.53	0.07	0.01	26.68	
4/29/2015	15:54:33	176.51	4.00	9.59	30.42	
4/29/2015	15:55:33	295.97	6.10	12.14	20.67	
4/29/2015	15:56:33	92.06	1.57	0.75	16.26	
4/29/2015	15:57:33	26.24	0.16	0.05	20.89	
4/29/2015	15:58:33	26.26	0.11	0.03	20.06	
4/29/2015	15:59:33	26.21	0.09	0.03	19.96	
4/29/2015	16:00:33	30.05	0.08	0.03	22.09	
4/29/2015	16:01:33	31.14	0.06	0.02	24.29	
4/29/2015	16:02:33	31.10	0.06	0.01	24.87	SO2 Span (25.00 ppm)
4/29/2015	16:03:33	54.76	1.54	2.96	25.87	
4/29/2015	16:04:33	11.62	11.25	11.51	18.45	
4/29/2015	16:05:33	0.25	11.79	11.58	7.73	
4/29/2015	16:06:33	0.28	11.88	11.60	4.77	
4/29/2015	16:07:33	0.26	11.92	11.61	3.28	
4/29/2015	16:08:33	0.25	11.95	11.61	2.10	O2/CO2 Span (11.96/11.98 %)
4/29/2015	16:09:33	10.55	6.45	5.14	1.85	

4/29/2015	16:10:33	0.94	0.41	0.10	2.19	
4/29/2015	16:11:33	0.80	0.22	0.06	1.74	
4/29/2015	16:12:33	0.74	0.15	0.05	1.27	
4/29/2015	16:13:33	0.63	0.12	0.03	0.97	
4/29/2015	16:14:33	0.82	0.10	0.03	0.83	Zero
4/29/2015	16:15:33	12.40	0.92	2.66	0.65	

End Run 4 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/29/2015	16:46:33	249.29	0.17	0.05	104.83	
4/29/2015	16:47:33	249.23	0.13	0.03	104.82	Nox Span (248.51 ppm)
4/29/2015	16:48:33	67.84	0.11	0.03	73.62	
4/29/2015	16:49:33	18.16	0.09	0.02	34.65	
4/29/2015	16:50:33	17.84	0.07	0.01	25.24	
4/29/2015	16:51:33	26.80	0.06	0.01	24.19	SO2 Span (25.00 ppm)
4/29/2015	16:52:33	28.24	0.06	0.02	27.54	
4/29/2015	16:53:33	13.17	8.43	7.70	25.27	
4/29/2015	16:54:33	0.28	11.72	11.56	13.74	
4/29/2015	16:55:33	0.27	11.85	11.59	8.02	
4/29/2015	16:56:33	0.28	11.90	11.59	5.69	
4/29/2015	16:57:33	0.25	11.94	11.61	4.13	O2/CO2 Span (11.96/11.98 %)
4/29/2015	16:58:33	0.79	8.43	5.82	3.25	
4/29/2015	16:59:33	0.25	0.47	0.10	3.25	
4/29/2015	17:00:33	0.28	0.22	0.05	2.76	
4/29/2015	17:01:33	0.26	0.15	0.04	2.16	
4/29/2015	17:02:33	0.27	0.12	0.04	1.86	
4/29/2015	17:03:33	0.26	0.10	0.03	1.29	
4/29/2015	17:04:33	0.25	0.09	0.02	1.16	
4/29/2015	17:05:33	0.27	0.08	0.02	0.81	
4/29/2015	17:06:33	0.27	0.07	0.01	0.63	Zero
4/29/2015	17:07:33	0.58	7.93	0.12	0.18	

BO-1 RATA
Direct Analyzer Calibations

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	6:09:18	0.12	0.19	0.02	-0.05	
4/30/2015	6:10:18	0.12	0.18	0.03	-0.06	Zero
4/30/2015	6:11:18	278.97	0.39	0.03	95.95	
4/30/2015	6:12:19	509.57	0.18	0.03	104.83	
4/30/2015	6:13:18	502.32	0.18	0.03	104.81	
4/30/2015	6:14:19	501.96	0.17	0.03	104.81	High NOx (501.70 ppm)
4/30/2015	6:15:18	457.29	0.17	0.03	104.81	
4/30/2015	6:16:19	262.32	0.17	0.03	104.81	
4/30/2015	6:17:18	270.21	0.16	0.03	104.81	
4/30/2015	6:18:19	249.85	0.16	0.03	104.85	
4/30/2015	6:19:18	250.18	0.16	0.03	104.82	Mid NOx (248.51 ppm)
4/30/2015	6:20:18	198.26	0.15	0.03	81.69	
4/30/2015	6:21:18	41.88	0.14	0.03	43.87	
4/30/2015	6:22:18	19.63	0.13	0.03	30.58	
4/30/2015	6:23:19	43.79	0.13	0.03	48.08	
4/30/2015	6:24:18	47.83	0.13	0.03	51.12	
4/30/2015	6:25:19	48.25	0.13	0.03	51.12	
4/30/2015	6:26:18	47.36	0.13	0.03	50.54	High SO2 (50.00 ppm)
4/30/2015	6:27:19	39.84	0.11	0.03	36.42	
4/30/2015	6:28:18	23.96	0.11	0.03	25.62	
4/30/2015	6:29:18	23.20	0.11	0.03	24.83	Mid SO2 (25.00 ppm)
4/30/2015	6:30:18	22.67	5.20	6.23	19.69	
4/30/2015	6:31:18	0.89	23.52	23.14	0.15	
4/30/2015	6:32:18	0.11	24.11	23.18	0.04	
4/30/2015	6:33:18	0.11	24.28	23.19	-0.03	
4/30/2015	6:34:18	-0.01	24.37	23.19	-0.04	
4/30/2015	6:35:18	0.10	24.42	23.19	-0.08	
4/30/2015	6:36:19	0.12	24.46	23.20	-0.10	
4/30/2015	6:37:18	0.09	23.33	22.93	-0.11	
4/30/2015	6:38:18	0.08	22.93	22.92	-0.08	
4/30/2015	6:39:18	0.10	22.92	22.92	-0.11	High O2/CO2 (22.92/22.91 %)
4/30/2015	6:40:18	0.14	16.60	14.95	-0.02	
4/30/2015	6:41:18	-0.04	11.99	11.40	1.86	
4/30/2015	6:42:18	-0.14	11.67	11.16	0.14	
4/30/2015	6:43:18	-0.15	11.42	11.17	0.05	
4/30/2015	6:44:18	-0.22	12.05	11.89	-0.05	
4/30/2015	6:45:18	-0.29	11.92	11.38	-0.02	
4/30/2015	6:46:18	0.26	3.44	1.43	-0.01	
4/30/2015	6:47:18	0.15	1.66	1.04	0.53	
4/30/2015	6:48:18	-0.50	10.15	11.13	0.00	
4/30/2015	6:49:18	-0.04	11.83	11.82	-0.10	
4/30/2015	6:50:18	-0.28	11.90	11.82	-0.10	
4/30/2015	6:51:18	-0.33	11.92	11.86	-0.08	
4/30/2015	6:52:18	-0.20	11.94	11.98	-0.06	
4/30/2015	6:53:18	-0.47	11.96	11.98	-0.11	Mid O2/CO2 (11.96/11.98 %)
4/30/2015	6:54:18	-0.04	12.69	9.91	0.01	

Initial System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	7:04:18	0.14	0.24	0.03	0.33	
4/30/2015	7:05:18	0.11	0.23	0.03	0.34	Zero
4/30/2015	7:06:18	17.16	3.86	0.10	28.61	
4/30/2015	7:07:18	233.89	0.41	0.04	104.80	
4/30/2015	7:08:18	241.55	0.24	0.03	104.80	
4/30/2015	7:09:18	242.05	0.22	0.03	104.78	
4/30/2015	7:10:18	242.16	0.20	0.03	104.79	
4/30/2015	7:11:18	242.12	0.19	0.03	104.80	Nox Span (248.51 ppm)
4/30/2015	7:12:18	180.70	0.18	0.04	77.95	
4/30/2015	7:13:18	23.13	0.17	0.03	24.47	
4/30/2015	7:14:18	23.51	0.16	0.03	22.62	
4/30/2015	7:15:18	25.76	0.32	0.04	23.11	
4/30/2015	7:16:18	26.91	0.60	0.04	23.90	
4/30/2015	7:17:18	26.07	0.16	0.03	23.21	
4/30/2015	7:18:18	26.28	0.14	0.03	23.07	SO2 Span (25.00 ppm)
4/30/2015	7:19:18	24.52	2.46	0.19	22.32	
4/30/2015	7:20:18	4.41	11.32	10.92	8.69	
4/30/2015	7:21:18	0.14	11.59	11.84	2.01	
4/30/2015	7:22:18	0.10	11.67	11.86	1.32	
4/30/2015	7:23:18	0.06	11.71	11.87	1.05	
4/30/2015	7:24:18	-0.29	11.74	11.87	0.86	
4/30/2015	7:25:18	-0.05	11.75	11.87	0.84	
4/30/2015	7:26:18	-0.19	11.76	11.87	0.74	O2/CO2 Span (11.96/11.98 %)
4/30/2015	7:27:18	0.04	13.92	7.60	0.80	

End Run 5 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	8:18:18	243.65	0.29	0.06	104.80	
4/30/2015	8:19:18	243.33	0.24	0.05	104.79	
4/30/2015	8:20:18	185.91	0.22	0.04	103.34	Nox Span (248.51 ppm)
4/30/2015	8:21:18	28.51	0.20	0.03	59.83	
4/30/2015	8:22:18	27.86	0.18	0.03	37.11	
4/30/2015	8:23:18	27.58	0.17	0.03	29.42	
4/30/2015	8:24:18	27.54	0.17	0.03	26.63	
4/30/2015	8:25:18	27.54	0.16	0.03	24.78	
4/30/2015	8:26:18	27.56	0.15	0.02	23.99	
4/30/2015	8:27:18	27.56	0.14	0.01	23.78	
4/30/2015	8:28:18	27.58	0.14	0.02	23.58	
4/30/2015	8:29:18	27.57	0.14	0.01	23.70	
4/30/2015	8:30:18	27.60	0.13	0.02	23.38	
4/30/2015	8:31:18	27.44	0.13	0.02	23.71	
4/30/2015	8:32:18	27.66	0.13	0.01	23.75	SO2 Span (25.00 ppm)
4/30/2015	8:33:18	29.53	0.33	0.91	23.32	
4/30/2015	8:34:18	85.59	8.42	10.65	25.06	
4/30/2015	8:35:18	0.18	11.60	11.81	14.22	
4/30/2015	8:36:18	0.16	11.74	11.84	8.31	
4/30/2015	8:37:18	0.16	11.80	11.85	5.82	
4/30/2015	8:38:18	0.16	11.83	11.87	4.38	
4/30/2015	8:39:18	0.15	11.82	11.83	3.70	O2/CO2 Span (11.96/11.98 %)
4/30/2015	8:40:18	4.19	3.51	2.04	3.49	

4/30/2015	8:41:18	0.85	0.42	0.10	4.35	
4/30/2015	8:42:18	0.75	0.27	0.07	4.70	
4/30/2015	8:43:18	0.62	0.22	0.05	4.44	
4/30/2015	8:44:18	0.53	0.18	0.03	4.03	
4/30/2015	8:45:18	0.19	0.16	0.03	3.78	
4/30/2015	8:46:18	0.48	0.15	0.03	3.65	
4/30/2015	8:47:18	0.38	0.14	0.03	3.21	
4/30/2015	8:48:18	0.18	0.13	0.01	3.13	
4/30/2015	8:49:18	0.19	0.12	0.01	2.90	
4/30/2015	8:50:18	0.13	0.12	0.02	2.77	
4/30/2015	8:51:18	0.18	0.12	0.02	2.57	
4/30/2015	8:52:18	0.18	0.11	0.02	2.47	
4/30/2015	8:53:18	0.20	0.11	0.02	2.33	
4/30/2015	8:54:18	0.16	0.11	0.01	2.07	
4/30/2015	8:55:18	0.14	0.09	0.01	2.10	
4/30/2015	8:56:18	0.19	0.09	0.01	2.04	
4/30/2015	8:57:18	0.16	0.09	0.01	1.88	
4/30/2015	8:58:18	0.18	0.09	0.02	1.84	
4/30/2015	8:59:18	0.18	0.09	0.02	1.79	
4/30/2015	9:00:18	0.20	0.08	0.01	1.68	
4/30/2015	9:01:18	0.18	0.08	0.02	1.59	
4/30/2015	9:02:18	0.20	0.09	0.02	1.60	
4/30/2015	9:03:18	0.15	0.09	0.03	1.49	
4/30/2015	9:04:18	0.15	0.10	0.04	1.46	
4/30/2015	9:05:18	0.18	0.11	0.05	1.42	Zero
4/30/2015	9:06:18	0.19	0.14	0.26	1.46	

End Run 6 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	9:41:18	0.49	0.19	0.03	0.62	
4/30/2015	9:42:18	0.18	0.17	0.04	0.59	Zero
4/30/2015	9:43:18	100.80	1.07	1.85	22.56	
4/30/2015	9:44:18	240.54	0.17	0.03	104.77	
4/30/2015	9:45:18	242.17	0.13	0.01	104.80	
4/30/2015	9:46:18	242.20	0.12	0.02	104.79	
4/30/2015	9:47:18	241.91	0.12	0.01	104.80	Nox Span (248.51 ppm)
4/30/2015	9:48:18	67.36	0.11	0.01	65.98	
4/30/2015	9:49:18	21.27	0.11	0.02	33.14	
4/30/2015	9:50:18	21.18	0.09	0.02	28.24	
4/30/2015	9:51:18	21.18	0.09	0.02	25.93	
4/30/2015	9:52:18	21.12	0.08	0.01	24.30	
4/30/2015	9:53:18	23.74	0.18	0.54	23.46	SO2 Span (25.00 ppm)
4/30/2015	9:54:18	242.82	5.26	12.31	26.72	
4/30/2015	9:55:18	293.88	5.93	12.77	16.72	
4/30/2015	9:56:18	294.47	6.03	12.75	12.97	
4/30/2015	9:57:18	231.59	7.96	11.38	10.02	
4/30/2015	9:58:18	1.39	11.56	11.85	7.02	
4/30/2015	9:59:18	0.17	11.67	11.85	6.06	
4/30/2015	10:00:18	0.20	11.70	11.85	4.82	
4/30/2015	10:01:18	0.15	11.73	11.86	4.30	
4/30/2015	10:02:18	0.17	11.74	11.86	4.07	O2/CO2 Span (11.96/11.98 %)
4/30/2015	10:03:18	18.91	10.77	12.19	3.97	

End Run 7 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	10:52:18	0.60	0.21	0.05	0.70	
4/30/2015	10:53:18	0.20	0.16	0.04	0.68	Zero
4/30/2015	10:54:18	51.98	0.92	1.46	3.34	
4/30/2015	10:55:18	234.60	0.17	0.04	91.79	
4/30/2015	10:56:18	241.32	0.12	0.02	104.79	
4/30/2015	10:57:18	241.88	0.10	0.01	104.79	Nox Span (248.51 ppm)
4/30/2015	10:58:18	208.55	0.09	0.01	103.15	
4/30/2015	10:59:18	24.18	0.09	0.02	49.51	
4/30/2015	11:00:18	21.24	0.08	0.02	31.02	
4/30/2015	11:01:18	21.24	0.07	0.02	27.29	
4/30/2015	11:02:18	21.27	0.07	0.02	25.20	
4/30/2015	11:03:18	21.89	0.07	0.03	23.46	
4/30/2015	11:04:18	22.05	0.08	0.04	23.75	
4/30/2015	11:05:18	22.07	0.08	0.07	23.93	
4/30/2015	11:06:18	22.32	0.09	0.10	23.69	SO2 Span (25.00 ppm)
4/30/2015	11:07:18	7.36	8.46	9.98	14.80	
4/30/2015	11:08:18	0.25	11.38	11.79	9.54	
4/30/2015	11:09:18	0.23	11.51	11.80	7.47	
4/30/2015	11:10:18	0.19	11.55	11.82	6.84	
4/30/2015	11:11:18	0.18	11.58	11.82	5.46	
4/30/2015	11:12:18	0.23	11.59	11.82	4.18	
4/30/2015	11:13:18	0.21	11.58	11.83	4.05	O2/CO2 Span (11.96/11.98 %)
4/30/2015	11:14:18	13.28	3.16	1.91	3.73	

End Run 8 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	11:59:18	0.29	0.12	0.04	0.77	
4/30/2015	12:00:18	0.27	0.10	0.03	0.79	Zero
4/30/2015	12:01:18	142.00	0.96	1.48	4.38	
4/30/2015	12:02:18	241.19	0.10	0.04	40.31	
4/30/2015	12:03:18	242.27	0.08	0.03	81.56	
4/30/2015	12:04:18	242.52	0.07	0.03	104.00	Nox Span (248.51 ppm)
4/30/2015	12:05:18	119.05	0.07	0.03	64.22	
4/30/2015	12:06:18	22.03	0.06	0.02	18.11	
4/30/2015	12:07:18	24.65	0.06	0.02	16.75	
4/30/2015	12:08:18	27.73	0.05	0.02	17.70	
4/30/2015	12:09:18	27.71	0.04	0.02	18.83	
4/30/2015	12:10:18	27.87	0.05	0.03	19.58	
4/30/2015	12:11:18	28.36	0.06	0.04	20.81	
4/30/2015	12:12:18	28.54	0.06	0.06	21.26	
4/30/2015	12:13:18	28.51	0.07	0.08	21.44	
4/30/2015	12:14:18	28.71	0.07	0.10	22.78	
4/30/2015	12:15:18	29.01	0.07	0.12	24.19	
4/30/2015	12:16:18	28.92	0.07	0.14	24.29	SO2 Span (25.00 ppm)
4/30/2015	12:17:18	29.07	0.21	0.56	16.69	
4/30/2015	12:18:18	5.05	9.95	11.39	7.91	
4/30/2015	12:19:18	0.57	11.21	11.74	5.42	
4/30/2015	12:20:18	0.26	11.31	11.75	4.23	
4/30/2015	12:21:18	0.27	11.37	11.77	3.17	

4/30/2015	12:22:18	0.27	11.39	11.77	2.72	O2/CO2 Span (11.96/11.98 %)
4/30/2015	12:23:18	2.78	11.03	11.84	2.58	

End Run 9 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
4/30/2015	13:02:18	0.88	0.11	0.03	0.91	
4/30/2015	13:03:18	0.29	0.09	0.02	0.91	Zero
4/30/2015	13:04:18	17.89	0.60	1.22	1.05	
4/30/2015	13:05:18	217.74	0.29	0.13	72.92	
4/30/2015	13:06:18	242.32	0.07	0.02	104.82	
4/30/2015	13:07:18	242.27	0.06	0.02	104.81	
4/30/2015	13:08:18	242.27	0.06	0.02	104.82	Nox Span (248.51 ppm)
4/30/2015	13:09:18	85.27	0.06	0.02	66.97	
4/30/2015	13:10:18	27.82	0.03	0.02	34.78	
4/30/2015	13:11:18	27.75	0.03	0.01	30.83	
4/30/2015	13:12:18	49.14	0.97	2.60	29.19	
4/30/2015	13:13:18	281.89	6.05	12.09	22.14	
4/30/2015	13:14:18	93.89	1.51	1.18	15.60	
4/30/2015	13:15:18	29.11	0.11	0.04	21.69	
4/30/2015	13:16:18	28.99	0.06	0.04	23.56	
4/30/2015	13:17:18	27.80	0.04	0.02	23.62	SO2 Span (25.00 ppm)
4/30/2015	13:18:18	57.32	3.12	4.72	22.72	
4/30/2015	13:19:18	1.46	10.86	11.69	12.00	
4/30/2015	13:20:18	0.28	11.11	11.73	7.24	
4/30/2015	13:21:18	0.27	11.18	11.74	6.14	
4/30/2015	13:22:18	0.30	11.22	11.75	5.07	
4/30/2015	13:23:18	0.31	11.24	11.75	4.05	O2/CO2 Span (11.96/11.98 %)
4/30/2015	13:24:18	75.79	9.55	12.17	4.22	

BO-2 RATA
Direct Analyzer Calibations

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	7:29:46	0.56	0.22	0.05	0.02	
5/4/2015	7:30:46	0.57	0.21	0.04	0.03	Zero
5/4/2015	7:31:46	93.10	0.42	0.04	53.06	
5/4/2015	7:32:46	496.55	0.21	0.05	104.58	
5/4/2015	7:33:46	498.03	0.20	0.05	104.58	
5/4/2015	7:34:45	500.27	0.19	0.04	104.59	
5/4/2015	7:35:46	502.63	0.19	0.05	104.58	High NOx (501.70 ppm)
5/4/2015	7:36:45	381.41	0.18	0.05	104.58	
5/4/2015	7:37:46	252.84	0.17	0.04	104.58	
5/4/2015	7:38:45	250.70	0.16	0.04	104.58	
5/4/2015	7:39:46	248.92	0.16	0.06	104.58	
5/4/2015	7:40:46	248.90	0.16	0.06	104.60	Mid NOx (248.51 ppm)
5/4/2015	7:41:45	197.65	0.15	0.06	103.72	
5/4/2015	7:42:46	99.26	0.15	0.06	100.98	
5/4/2015	7:43:45	97.83	0.15	0.06	97.23	
5/4/2015	7:44:46	56.45	0.15	0.07	52.00	
5/4/2015	7:45:45	58.26	0.14	0.06	60.21	
5/4/2015	7:46:46	58.15	0.14	0.07	60.11	
5/4/2015	7:47:45	49.80	0.13	0.06	48.66	
5/4/2015	7:48:46	47.54	0.13	0.06	49.25	
5/4/2015	7:49:45	47.61	0.13	0.06	49.38	High SO2 (50.00 ppm)
5/4/2015	7:50:45	35.11	0.12	0.06	30.31	
5/4/2015	7:51:46	23.08	0.13	0.06	24.09	
5/4/2015	7:52:45	23.35	0.12	0.06	24.50	
5/4/2015	7:53:46	23.83	0.13	0.06	24.71	
5/4/2015	7:54:45	23.79	0.11	0.06	24.82	Mid SO2 (25.00 ppm)
5/4/2015	7:55:46	23.79	0.10	0.06	13.02	
5/4/2015	7:56:45	22.95	6.21	6.39	3.57	
5/4/2015	7:57:46	16.11	21.25	20.22	0.70	
5/4/2015	7:58:45	0.04	21.93	23.12	0.08	
5/4/2015	7:59:46	0.12	22.08	23.13	0.02	
5/4/2015	8:00:45	0.40	22.15	23.14	0.03	
5/4/2015	8:01:45	0.18	22.76	22.95	0.03	
5/4/2015	8:02:45	0.09	22.96	22.94	0.02	
5/4/2015	8:03:45	0.25	22.96	22.94	0.03	
5/4/2015	8:04:46	0.13	22.93	22.93	0.03	
5/4/2015	8:05:45	0.03	22.92	22.92	-0.01	High O2/CO2 (22.92/22.91 %)
5/4/2015	8:06:46	0.36	17.69	16.33	0.02	
5/4/2015	8:07:45	-0.04	12.07	11.71	0.04	
5/4/2015	8:08:46	-0.03	12.04	11.82	0.01	
5/4/2015	8:09:45	-0.07	12.33	12.11	0.01	
5/4/2015	8:10:45	-0.04	12.11	11.97	0.02	
5/4/2015	8:11:45	-0.03	11.99	11.98	0.03	
5/4/2015	8:12:45	-0.12	11.98	11.98	0.03	
5/4/2015	8:13:45	-0.08	11.96	11.98	0.01	Mid O2/CO2 (11.96/11.98 %)
5/4/2015	8:14:45	0.34	9.38	7.73	0.07	

Initial System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	8:06:03	-0.23	0.32	0.06	0.53	
5/4/2015	8:07:04	0.33	0.32	0.06	0.54	Zero
5/4/2015	8:08:03	48.52	2.59	4.13	0.90	
5/4/2015	8:09:04	224.50	4.70	5.06	33.07	
5/4/2015	8:10:03	240.90	0.42	0.08	104.74	
5/4/2015	8:11:03	242.41	0.33	0.06	104.76	
5/4/2015	8:12:03	246.51	0.33	0.09	104.72	
5/4/2015	8:13:03	246.43	0.36	0.14	104.74	Nox Span (248.51 ppm)
5/4/2015	8:14:03	223.42	1.35	1.49	90.59	
5/4/2015	8:15:03	31.66	0.45	0.23	32.94	
5/4/2015	8:16:04	27.00	0.38	0.20	27.06	
5/4/2015	8:17:03	27.48	0.39	0.23	25.01	
5/4/2015	8:18:03	28.50	0.41	0.27	24.09	
5/4/2015	8:19:03	29.12	0.40	0.26	23.71	SO2 Span (25.00 ppm)
5/4/2015	8:20:03	60.05	3.06	4.22	21.87	
5/4/2015	8:21:03	6.64	11.40	11.74	9.87	
5/4/2015	8:22:03	0.15	11.72	11.78	5.64	
5/4/2015	8:23:03	-0.02	11.80	11.79	4.47	
5/4/2015	8:24:03	0.15	11.84	11.79	3.92	O2/CO2 Span (11.96/11.98 %)
5/4/2015	8:25:03	2.82	11.65	11.70	3.54	

End Run 1 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	9:09:03	248.17	0.54	0.10	104.75	
5/4/2015	9:10:03	247.58	0.39	0.09	104.73	Nox Span (248.51 ppm)
5/4/2015	9:11:03	228.31	1.01	0.96	96.85	
5/4/2015	9:12:03	28.00	0.36	0.09	33.31	
5/4/2015	9:13:03	23.62	0.29	0.07	24.46	Zero (O2/CO2)
5/4/2015	9:14:03	25.80	0.27	0.08	24.61	SO2 Span (25.00 ppm)
5/4/2015	9:15:03	44.55	2.07	2.99	23.63	
5/4/2015	9:16:03	9.29	11.27	11.69	13.29	
5/4/2015	9:17:03	0.49	11.68	11.75	6.80	
5/4/2015	9:18:03	0.33	11.76	11.76	2.76	
5/4/2015	9:19:03	0.47	11.81	11.77	0.87	Zero (NOx/SO2),
5/4/2015	9:20:03	13.75	11.25	11.70	1.59	O2/CO2 Span (11.96/11.98 %)

End Run 2 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	9:54:03	247.51	0.32	0.08	104.73	
5/4/2015	9:55:03	246.61	0.29	0.08	104.73	Nox Span (248.51 ppm)
5/4/2015	9:56:03	245.78	0.63	0.74	104.75	
5/4/2015	9:57:03	58.46	0.46	0.19	50.30	
5/4/2015	9:58:03	22.25	0.24	0.06	25.23	
5/4/2015	9:59:03	23.49	0.23	0.06	22.44	
5/4/2015	10:00:03	25.86	0.22	0.06	23.24	
5/4/2015	10:01:03	25.93	0.20	0.06	23.52	SO2 Span (25.00 ppm)
5/4/2015	10:02:03	31.36	0.56	1.04	23.63	
5/4/2015	10:03:03	32.18	10.07	11.08	16.15	
5/4/2015	10:04:03	0.52	11.61	11.71	7.15	
5/4/2015	10:05:03	0.50	11.72	11.72	4.69	
5/4/2015	10:06:03	0.36	11.77	11.73	3.56	O2/CO2 Span (11.96/11.98 %)
5/4/2015	10:07:03	14.91	9.65	8.78	2.99	

5/4/2015	10:08:03	2.78	0.69	0.14	2.91	
5/4/2015	10:09:03	0.67	0.38	0.10	2.57	
5/4/2015	10:10:03	0.53	0.30	0.08	2.21	
5/4/2015	10:11:03	0.50	0.26	0.06	1.94	
5/4/2015	10:12:03	0.51	0.23	0.06	1.80	
5/4/2015	10:13:03	0.51	0.22	0.06	1.61	
5/4/2015	10:14:03	0.49	0.20	0.07	1.51	
5/4/2015	10:15:03	0.52	0.20	0.06	1.37	
5/4/2015	10:16:03	0.50	0.19	0.06	1.29	Zero
5/4/2015	10:17:03	71.41	3.01	5.44	1.70	

End Run 3 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	10:44:03	246.80	0.41	0.08	104.74	
5/4/2015	10:45:03	246.51	0.30	0.06	104.74	Nox Span (248.51 ppm)
5/4/2015	10:46:03	245.89	0.37	0.40	104.71	
5/4/2015	10:47:03	147.46	3.09	5.20	66.39	
5/4/2015	10:48:03	264.99	7.28	10.95	24.62	
5/4/2015	10:49:03	82.41	1.44	0.62	22.56	
5/4/2015	10:50:03	29.18	0.29	0.06	25.58	
5/4/2015	10:51:03	28.02	0.23	0.05	25.23	
5/4/2015	10:52:03	27.22	0.21	0.04	24.35	SO2 Span (25.00 ppm)
5/4/2015	10:53:03	55.20	2.08	3.22	23.40	
5/4/2015	10:54:03	11.38	11.18	11.62	13.74	
5/4/2015	10:55:03	0.54	11.61	11.68	7.45	
5/4/2015	10:56:03	0.52	11.69	11.69	6.33	
5/4/2015	10:57:03	0.51	11.73	11.69	3.78	O2/CO2 Span (11.96/11.98 %)
5/4/2015	10:58:03	14.82	5.19	4.03	3.36	
5/4/2015	10:59:03	0.55	0.47	0.09	3.18	
5/4/2015	11:00:03	0.52	0.31	0.07	2.76	
5/4/2015	11:01:03	0.52	0.26	0.06	2.42	
5/4/2015	11:02:03	0.53	0.23	0.05	2.17	
5/4/2015	11:03:03	0.50	0.21	0.04	2.04	
5/4/2015	11:04:03	0.53	0.19	0.04	1.89	
5/4/2015	11:05:03	0.50	0.18	0.04	1.74	
5/4/2015	11:06:03	0.51	0.18	0.04	1.65	
5/4/2015	11:07:03	0.53	0.17	0.04	1.47	
5/4/2015	11:08:03	0.53	0.17	0.04	1.35	Zero
5/4/2015	11:09:03	116.74	4.25	7.38	1.98	

End Run 4 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	11:37:03	245.28	0.32	0.07	104.74	
5/4/2015	11:38:03	245.21	0.25	0.06	104.75	Nox Span (248.51 ppm)
5/4/2015	11:39:03	248.87	1.79	2.69	96.80	
5/4/2015	11:40:03	53.37	0.45	0.15	39.68	
5/4/2015	11:41:03	25.30	0.20	0.06	28.71	
5/4/2015	11:42:03	27.31	0.18	0.05	27.94	
5/4/2015	11:43:03	27.24	0.17	0.04	27.02	
5/4/2015	11:44:03	27.24	0.15	0.04	26.13	
5/4/2015	11:45:03	27.24	0.14	0.04	25.50	
5/4/2015	11:46:03	27.23	0.14	0.04	25.01	
5/4/2015	11:47:03	27.37	0.14	0.05	24.63	SO2 Span (25.00 ppm)

5/4/2015	11:48:03	43.89	7.28	8.82	19.07	
5/4/2015	11:49:03	0.32	11.37	11.63	8.12	
5/4/2015	11:50:03	0.12	11.52	11.66	4.95	
5/4/2015	11:51:03	-0.16	11.57	11.67	3.74	O2/CO2 Span (11.96/11.98 %)
5/4/2015	11:52:03	15.97	9.30	8.57	3.03	
5/4/2015	11:53:03	2.33	0.60	0.13	2.91	
5/4/2015	11:54:03	0.54	0.31	0.08	2.67	
5/4/2015	11:55:03	0.53	0.23	0.06	2.36	
5/4/2015	11:56:03	0.56	0.19	0.06	2.09	
5/4/2015	11:57:03	0.55	0.17	0.06	1.94	
5/4/2015	11:58:03	0.56	0.15	0.04	1.74	
5/4/2015	11:59:03	0.54	0.14	0.04	1.69	
5/4/2015	12:00:03	0.57	0.14	0.04	1.57	
5/4/2015	12:01:03	0.57	0.13	0.04	1.44	Zero
5/4/2015	12:02:03	43.18	2.21	4.22	1.72	

End Run 5 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	12:33:03	245.77	0.30	0.07	104.71	
5/4/2015	12:34:03	245.43	0.22	0.06	104.75	Nox Span (248.51 ppm)
5/4/2015	12:35:03	245.00	0.53	0.72	104.54	
5/4/2015	12:36:03	58.77	0.31	0.13	48.21	
5/4/2015	12:37:03	24.43	0.15	0.04	29.88	
5/4/2015	12:38:03	24.41	0.13	0.04	26.50	
5/4/2015	12:39:03	24.41	0.12	0.04	24.96	
5/4/2015	12:40:03	25.69	0.12	0.04	24.56	SO2 Span (25.00 ppm)
5/4/2015	12:41:03	55.73	2.36	3.67	23.80	
5/4/2015	12:42:03	7.12	10.95	11.50	12.41	
5/4/2015	12:43:03	-0.09	11.33	11.59	6.56	
5/4/2015	12:44:03	-0.18	11.40	11.60	4.67	
5/4/2015	12:45:03	-0.17	11.44	11.61	3.53	
5/4/2015	12:46:03	-0.15	11.48	11.62	2.83	O2/CO2 Span (11.96/11.98 %)
5/4/2015	12:47:03	11.59	9.02	8.20	2.54	
5/4/2015	12:48:03	1.36	0.60	0.17	2.50	
5/4/2015	12:49:03	0.57	0.30	0.09	2.29	
5/4/2015	12:50:03	0.57	0.22	0.08	2.11	
5/4/2015	12:51:03	0.57	0.18	0.06	1.95	Zero
5/4/2015	12:52:03	146.73	5.19	8.80	2.71	

End Run 6 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	13:24:03	245.53	0.22	0.06	104.70	
5/4/2015	13:25:03	245.25	0.22	0.21	104.72	Nox Span (248.51 ppm)
5/4/2015	13:26:03	110.52	0.69	0.69	61.81	
5/4/2015	13:27:03	26.86	0.16	0.06	30.58	
5/4/2015	13:28:03	24.97	0.14	0.05	25.93	
5/4/2015	13:29:03	24.89	0.13	0.04	24.65	
5/4/2015	13:30:03	27.03	0.12	0.04	25.13	SO2 Span (25.00 ppm)
5/4/2015	13:31:03	52.84	2.78	4.08	24.12	
5/4/2015	13:32:03	4.57	11.49	11.56	12.09	
5/4/2015	13:33:03	0.50	11.84	11.65	6.40	
5/4/2015	13:34:03	0.50	11.93	11.67	4.41	O2/CO2 Span (11.96/11.98 %)
5/4/2015	13:35:03	14.03	10.42	9.42	3.63	

5/4/2015	13:36:03	4.86	0.73	0.17	3.49	
5/4/2015	13:37:03	0.51	0.30	0.08	2.86	
5/4/2015	13:38:03	0.52	0.21	0.06	2.53	
5/4/2015	13:39:03	0.54	0.17	0.05	2.29	
5/4/2015	13:40:03	0.53	0.14	0.04	2.15	
5/4/2015	13:41:03	0.55	0.13	0.04	1.91	Zero
5/4/2015	13:42:03	31.04	1.85	3.73	2.00	

End Run 7 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	14:09:03	247.53	0.27	0.13	104.74	
5/4/2015	14:10:03	246.43	0.18	0.10	104.75	Nox Span (248.51 ppm)
5/4/2015	14:11:03	226.43	0.73	0.96	98.08	
5/4/2015	14:12:03	28.91	0.17	0.09	38.21	
5/4/2015	14:13:03	23.65	0.12	0.08	27.89	
5/4/2015	14:14:03	23.63	0.11	0.07	25.63	
5/4/2015	14:15:03	23.66	0.09	0.06	25.31	
5/4/2015	14:16:03	23.70	0.09	0.06	23.81	
5/4/2015	14:17:03	24.31	0.08	0.06	23.00	
5/4/2015	14:18:03	27.23	0.08	0.07	24.31	
5/4/2015	14:19:03	27.17	0.07	0.06	24.36	Zero (O2/CO2),
5/4/2015	14:20:03	50.87	1.52	2.74	23.55	SO2 Span (25.00 ppm)
5/4/2015	14:21:03	18.44	10.87	11.52	12.68	
5/4/2015	14:22:03	0.28	11.59	11.67	5.95	
5/4/2015	14:23:03	-0.17	11.69	11.70	4.03	
5/4/2015	14:24:03	-0.14	11.74	11.71	3.16	
5/4/2015	14:25:03	-0.19	11.77	11.71	2.59	
5/4/2015	14:26:03	-0.02	11.76	11.73	2.15	Zero (NOx)
5/4/2015	14:27:03	9.18	11.75	11.77	1.93	O2/CO2 Span (11.96/11.98 %),
5/4/2015	14:28:03	-0.16	11.82	11.72	1.76	Zero (SO2)

End Run 8 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	14:55:03	245.69	0.34	0.09	104.74	
5/4/2015	14:56:03	246.52	0.22	0.06	104.76	Nox Span (248.51 ppm)
5/4/2015	14:57:03	221.41	0.64	0.75	102.81	
5/4/2015	14:58:03	28.59	0.17	0.06	54.72	
5/4/2015	14:59:03	24.88	0.13	0.05	32.98	
5/4/2015	15:00:03	24.83	0.12	0.04	26.90	
5/4/2015	15:01:03	24.82	0.10	0.03	24.87	
5/4/2015	15:02:03	25.10	0.09	0.02	23.87	SO2 Span (25.00 ppm)
5/4/2015	15:03:03	27.24	0.08	0.02	24.10	
5/4/2015	15:04:03	44.25	6.94	8.43	21.44	
5/4/2015	15:05:03	0.55	11.60	11.60	11.69	
5/4/2015	15:06:03	0.37	11.80	11.66	7.24	
5/4/2015	15:07:03	0.10	11.87	11.68	5.15	
5/4/2015	15:08:03	0.30	11.91	11.68	3.94	O2/CO2 Span (11.96/11.98 %)
5/4/2015	15:09:03	17.88	6.13	4.94	3.37	
5/4/2015	15:10:03	0.54	0.43	0.12	3.01	
5/4/2015	15:11:03	0.52	0.24	0.07	2.64	
5/4/2015	15:12:03	0.51	0.17	0.06	2.29	
5/4/2015	15:13:03	0.53	0.14	0.06	2.04	
5/4/2015	15:14:03	0.59	0.13	0.04	1.83	Zero

5/4/2015	15:15:03	35.66	1.98	3.98	1.77	

End Run 9 System Bias/Drift Check

Date	Time	NOx [ppm]	O2 [%]	CO2 [%]	SO2 [ppm]	
5/4/2015	15:43:03	246.85	0.40	0.12	104.75	
5/4/2015	15:44:03	247.41	0.23	0.09	104.74	Nox Span (248.51 ppm)
5/4/2015	15:45:03	222.98	0.69	0.82	100.94	
5/4/2015	15:46:03	28.83	0.18	0.08	45.09	
5/4/2015	15:47:03	25.11	0.13	0.06	28.00	
5/4/2015	15:48:03	25.59	0.11	0.06	24.35	
5/4/2015	15:49:03	27.25	0.09	0.06	24.13	SO2 Span (25.00 ppm)
5/4/2015	15:50:03	22.51	3.98	2.52	22.93	
5/4/2015	15:51:03	1.12	11.42	11.62	13.00	
5/4/2015	15:52:03	0.28	11.69	11.69	6.88	
5/4/2015	15:53:03	0.00	11.76	11.71	4.75	
5/4/2015	15:54:03	-0.09	11.80	11.71	3.67	O2/CO2 Span (11.96/11.98 %)
5/4/2015	15:55:03	0.23	9.71	7.41	2.89	
5/4/2015	15:56:03	0.55	0.58	0.15	2.72	
5/4/2015	15:57:03	0.55	0.26	0.08	2.40	
5/4/2015	15:58:03	0.54	0.18	0.06	2.13	
5/4/2015	15:59:03	0.54	0.14	0.06	1.95	
5/4/2015	16:00:03	0.53	0.11	0.04	1.76	Zero
5/4/2015	16:01:03	0.05	6.02	0.06	1.55	

BO-4 RATA

Direct Analyzer Calibrations(CO, O2, CO2)

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	7:07:00	0.08	0.04	0.19	0.01	
4/28/2015	7:08:00	0.41	0.05	0.18	0.01	Zero
4/28/2015	7:09:00	4.92	25.97	0.34	0.01	
4/28/2015	7:10:00	60.97	97.88	0.20	0.01	
4/28/2015	7:11:00	96.81	98.69	0.18	0.01	
4/28/2015	7:12:00	97.99	98.87	0.16	0.01	
4/28/2015	7:13:00	98.39	98.97	0.16	0.01	
4/28/2015	7:14:00	98.69	99.12	0.15	0.01	
4/28/2015	7:15:00	99.03	99.19	0.14	0.01	
4/28/2015	7:16:00	99.44	99.31	0.14	0.01	
4/28/2015	7:17:00	86.76	86.79	0.12	0.01	
4/28/2015	7:18:00	50.31	49.95	0.16	0.01	
4/28/2015	7:19:00	48.11	48.77	0.20	0.01	
4/28/2015	7:20:00	49.70	49.55	0.11	0.01	
4/28/2015	7:21:00	49.94	49.54	0.11	0.01	
4/28/2015	7:22:00	50.03	49.54	0.10	0.02	High CO (49.37 ppm)
4/28/2015	7:23:00	34.72	34.12	0.09	0.03	
4/28/2015	7:24:00	25.39	24.68	0.08	0.03	
4/28/2015	7:25:00	25.44	24.67	0.08	0.03	Mid CO (24.68 ppm)
4/28/2015	7:26:00	29.02	27.79	12.28	13.92	
4/28/2015	8:28:59	8.17	-0.34	22.88	22.06	
4/28/2015	8:29:59	8.08	-0.33	22.89	21.90	High O2/CO2 22.92/22.91 %)
4/28/2015	8:30:59	8.07	-0.39	22.89	21.75	
4/28/2015	8:31:59	7.87	18.14	20.45	18.28	
4/28/2015	8:32:59	7.38	0.99	14.06	13.71	
4/28/2015	8:33:59	7.49	0.16	13.92	13.66	
4/28/2015	8:34:59	7.59	0.18	13.87	13.67	
4/28/2015	8:35:59	7.33	0.18	13.84	13.68	
4/28/2015	8:36:59	7.55	0.21	13.81	13.66	
4/28/2015	8:37:59	7.29	0.22	13.80	13.65	
4/28/2015	8:38:59	7.62	0.85	13.83	13.49	
4/28/2015	8:39:59	7.10	7.27	12.32	11.90	
4/28/2015	8:40:59	7.93	-0.42	11.98	11.86	
4/28/2015	8:41:59	8.13	-0.30	11.96	11.93	
4/28/2015	8:42:59	8.40	-0.30	11.94	11.99	
4/28/2015	8:43:59	8.29	-0.27	11.95	11.99	Mid O2/CO2 (11.96/11.98 %)
4/28/2015	7:46:48	-0.22	3.39	20.36	0.19	

Direct Analyzer Calibrations(NOx)

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	11:39:48	0.13	0.22	0.01	0.04	
4/28/2015	11:40:48	0.05	0.17	0.00	0.05	Zero
4/28/2015	11:41:48	1.37	3.33	0.01	0.05	
4/28/2015	11:42:48	40.55	47.61	-0.01	0.04	
4/28/2015	11:43:48	49.80	49.24	-0.01	0.04	
4/28/2015	11:44:48	50.28	49.30	-0.01	0.04	

4/28/2015	11:45:48	50.35	49.39	-0.02	0.04	High NOx (49.70 ppm)
4/28/2015	11:46:48	44.48	43.53	-0.02	0.04	
4/28/2015	11:47:48	25.64	24.82	-0.03	0.04	
4/28/2015	11:48:48	25.47	24.77	-0.03	0.05	
4/28/2015	11:49:48	25.17	25.07	-0.01	0.05	
4/28/2015	11:50:48	24.92	25.03	0.00	0.05	
4/28/2015	11:51:48	24.86	24.91	0.00	0.05	Mid NOx (24.85 ppm)
4/28/2015	11:52:48	24.56	24.63	1.16	0.05	

Initial System Bias/Drift Check (CO, O2, CO2)

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	8:17:48	0.04	0.36	0.23	0.04	
4/28/2015	8:18:48	0.01	0.32	0.20	0.04	Zero
4/28/2015	8:19:48	0.04	0.33	0.18	0.05	
4/28/2015	8:20:48	0.82	2.26	3.72	0.07	
4/28/2015	8:21:48	19.35	23.38	0.30	0.06	
4/28/2015	8:22:48	24.18	24.34	0.18	0.04	
4/28/2015	8:23:48	24.92	24.48	0.14	0.05	
4/28/2015	8:24:48	24.72	24.50	0.13	0.04	
4/28/2015	8:25:48	24.82	24.55	0.12	0.04	
4/28/2015	8:26:48	24.80	24.54	0.10	0.04	
4/28/2015	8:27:48	24.67	24.54	0.09	0.05	
4/28/2015	8:28:48	24.70	24.56	0.09	0.05	
4/28/2015	8:29:48	24.82	24.51	0.08	0.04	
4/28/2015	8:30:48	24.79	24.47	0.08	0.05	
4/28/2015	8:31:48	24.92	24.49	0.07	0.05	
4/28/2015	8:32:48	24.79	24.52	0.07	0.04	
4/28/2015	8:33:48	24.86	24.50	0.06	0.04	
4/28/2015	8:34:48	24.77	24.51	0.06	0.05	
4/28/2015	8:35:48	24.75	24.53	0.05	0.04	
4/28/2015	8:36:48	24.81	24.49	0.05	0.05	
4/28/2015	8:37:48	24.75	24.52	0.04	0.04	CO Span (24.68 ppm)
4/28/2015	8:38:48	17.54	18.43	6.91	2.29	
4/28/2015	8:39:48	1.26	1.52	12.36	10.45	
4/28/2015	8:40:48	-0.25	-0.06	11.54	11.82	
4/28/2015	8:41:48	-0.18	-0.11	11.58	11.83	
4/28/2015	8:42:48	-0.20	-0.14	11.61	11.85	
4/28/2015	8:43:48	-0.21	-0.13	11.62	11.85	
4/28/2015	8:44:48	-0.12	-0.23	11.63	11.85	
4/28/2015	8:45:48	-0.10	-0.14	11.64	11.85	O2/CO2 Span (12.00/11.99%)
4/28/2015	8:46:48	0.17	-0.20	13.33	8.46	

Initial System Bias/Drift Check (NOx)

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	11:55:48	-0.03	0.05	0.16	0.04	
4/28/2015	11:56:48	0.05	0.05	0.10	0.04	Zero
4/28/2015	11:57:48	0.08	0.02	0.23	0.65	
4/28/2015	11:58:48	15.86	15.45	0.28	0.25	
4/28/2015	11:59:48	23.83	24.65	0.07	0.05	
4/28/2015	12:00:48	24.14	24.68	0.06	0.04	
4/28/2015	12:01:48	24.84	24.77	0.05	0.04	

4/28/2015	12:02:48	24.82	24.76	0.04	0.05	NOx Span (24.85 ppm)
4/28/2015	12:03:48	23.83	23.44	0.65	2.35	

End Run 1 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	12:29:48	0.06	0.18	0.14	0.07	
4/28/2015	12:30:48	0.13	0.28	0.09	0.06	
4/28/2015	12:31:48	0.13	0.25	0.07	0.06	
4/28/2015	12:32:48	0.01	0.24	0.06	0.05	Zero
4/28/2015	12:33:48	0.27	0.18	0.17	0.47	
4/28/2015	12:34:48	18.40	18.16	0.12	0.09	
4/28/2015	12:35:48	25.26	24.37	0.04	0.05	
4/28/2015	12:36:48	25.50	24.44	0.03	0.05	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	12:37:48	24.94	24.56	0.03	0.12	
4/28/2015	12:38:48	11.25	10.42	7.44	9.22	
4/28/2015	12:39:48	0.36	0.49	11.24	11.66	
4/28/2015	12:40:48	-0.13	0.04	11.39	11.70	
4/28/2015	12:41:48	-0.14	0.05	11.45	11.71	
4/28/2015	12:42:48	-0.20	0.03	11.48	11.72	
4/28/2015	12:43:48	-0.14	0.04	11.51	11.73	
4/28/2015	12:44:48	-0.21	0.04	11.52	11.73	
4/28/2015	12:45:48	-0.14	0.04	11.53	11.73	
4/28/2015	12:46:48	-0.18	0.04	11.54	11.73	
4/28/2015	12:47:48	-0.16	0.03	11.55	11.73	
4/28/2015	12:48:48	-0.14	0.03	11.55	11.73	
4/28/2015	12:49:48	-0.20	0.02	11.56	11.73	O2/CO2 Span (12.00/11.99%)
4/28/2015	12:50:48	-0.22	0.03	11.55	11.72	
4/28/2015	12:51:48	5.51	0.18	5.70	9.78	

End Run 2 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	13:23:48	0.15	0.10	0.06	0.03	
4/28/2015	13:24:48	0.16	0.14	0.05	0.03	Zero
4/28/2015	13:25:48	0.08	0.10	0.14	0.63	
4/28/2015	13:26:48	12.29	11.36	0.74	1.30	
4/28/2015	13:27:48	23.86	23.98	0.05	0.04	
4/28/2015	13:28:48	24.49	24.22	0.03	0.03	
4/28/2015	13:29:48	24.59	24.31	0.03	0.03	
4/28/2015	13:30:48	24.45	24.36	0.02	0.03	
4/28/2015	13:31:48	24.40	24.40	0.02	0.03	
4/28/2015	13:32:48	24.41	24.38	0.02	0.03	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	13:33:48	24.33	24.36	0.02	0.03	
4/28/2015	13:34:48	20.36	19.68	2.94	4.54	
4/28/2015	13:35:48	0.49	0.35	10.91	11.57	
4/28/2015	13:36:48	0.11	0.43	11.18	11.62	
4/28/2015	13:37:48	-0.12	0.04	11.28	11.68	
4/28/2015	13:38:48	-0.18	-0.01	11.32	11.69	
4/28/2015	13:39:48	-0.17	-0.05	11.34	11.68	
4/28/2015	13:40:48	-0.26	-0.04	11.36	11.69	O2/CO2 Span (12.00/11.99%)
4/28/2015	13:41:48	-0.05	-0.05	10.76	11.36	

End Run 3 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	14:11:48	0.11	0.08	0.10	0.07	
4/28/2015	14:12:48	0.03	0.08	0.06	0.06	Zero
4/28/2015	14:13:48	0.18	0.05	0.20	0.64	
4/28/2015	14:14:48	16.32	16.49	0.19	0.17	
4/28/2015	14:15:48	24.42	23.93	0.03	0.05	
4/28/2015	14:16:48	24.76	24.06	0.02	0.05	
4/28/2015	14:17:48	24.58	24.20	0.01	0.05	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	14:18:48	20.59	19.40	2.92	4.57	
4/28/2015	14:19:48	0.42	0.32	10.84	11.56	
4/28/2015	14:20:48	0.16	0.11	11.10	11.61	
4/28/2015	14:21:48	0.29	0.11	11.18	11.64	
4/28/2015	14:22:48	0.01	-0.01	11.23	11.65	
4/28/2015	14:23:48	0.03	0.00	11.25	11.66	
4/28/2015	14:24:48	0.03	-0.06	11.26	11.68	O2/CO2 Span (12.00/11.99%)
4/28/2015	14:25:48	0.11	-0.06	10.76	11.38	

End Run 4 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	15:00:48	0.37	0.06	0.16	0.10	
4/28/2015	15:01:48	0.21	0.04	0.09	0.07	Zero
4/28/2015	15:02:48	0.87	-0.05	0.30	0.72	
4/28/2015	15:03:48	18.58	18.65	0.11	0.08	
4/28/2015	15:04:48	24.67	23.76	0.03	0.05	
4/28/2015	15:05:48	25.00	23.85	0.03	0.05	
4/28/2015	15:06:48	25.09	23.99	0.02	0.05	
4/28/2015	15:07:48	24.79	24.08	0.02	0.04	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	15:08:48	21.87	20.80	2.32	3.79	
4/28/2015	15:09:48	1.24	0.54	10.76	11.53	
4/28/2015	15:10:48	0.54	0.05	11.05	11.58	
4/28/2015	15:11:48	0.60	0.04	11.14	11.61	
4/28/2015	15:12:48	0.39	-0.12	11.19	11.63	
4/28/2015	15:13:48	0.34	-0.25	11.21	11.64	
4/28/2015	15:14:48	0.32	-0.25	11.24	11.64	
4/28/2015	15:15:48	0.32	-0.21	11.25	11.64	O2/CO2 Span (12.00/11.99%)
4/28/2015	15:16:48	0.38	-0.17	11.20	11.59	

End Run 5 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	15:44:48	1.19	0.02	0.07	0.07	
4/28/2015	15:45:48	1.03	-0.01	0.05	0.06	Zero
4/28/2015	15:46:48	1.05	-0.05	0.13	0.44	
4/28/2015	15:47:48	16.73	16.29	0.14	0.16	
4/28/2015	15:48:48	24.24	23.65	0.02	0.06	
4/28/2015	15:49:48	24.57	23.80	0.02	0.05	
4/28/2015	15:50:48	24.71	23.87	0.02	0.05	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	15:51:48	23.34	22.10	1.42	2.69	
4/28/2015	15:52:48	2.61	1.47	10.62	11.51	
4/28/2015	15:53:48	0.97	-0.01	11.02	11.57	
4/28/2015	15:54:48	1.01	0.01	11.12	11.60	

4/28/2015	15:55:48	0.79	-0.15	11.17	11.62	
4/28/2015	15:56:48	0.78	-0.29	11.20	11.63	
4/28/2015	15:57:48	0.62	-0.28	11.22	11.63	
4/28/2015	15:58:48	0.61	-0.35	11.24	11.64	
4/28/2015	15:59:48	0.61	-0.35	11.25	11.64	
4/28/2015	16:00:48	0.57	-0.30	11.25	11.64	O2/CO2 Span (12.00/11.99%)
4/28/2015	16:01:48	0.71	-0.31	10.84	11.38	

End Run 6 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	16:34:48	0.59	-0.01	0.10	0.05	
4/28/2015	16:35:48	0.19	0.04	0.07	0.04	Zero
4/28/2015	16:36:48	0.30	-0.05	0.23	0.57	
4/28/2015	16:37:48	16.75	17.47	0.14	0.09	
4/28/2015	16:38:48	23.28	23.74	0.04	0.03	
4/28/2015	16:39:48	23.67	23.86	0.03	0.03	
4/28/2015	16:40:48	23.64	23.95	0.03	0.03	
4/28/2015	16:41:48	24.40	23.99	0.03	0.02	
4/28/2015	16:42:48	24.77	24.02	0.02	0.03	
4/28/2015	16:43:48	24.64	23.99	0.02	0.02	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	16:44:48	23.98	22.86	0.50	1.41	
4/28/2015	16:45:48	4.10	3.58	10.10	11.25	
4/28/2015	16:46:48	0.10	0.05	11.11	11.54	
4/28/2015	16:47:48	-0.09	-0.12	11.23	11.58	
4/28/2015	16:48:48	-0.41	-0.29	11.29	11.60	
4/28/2015	16:49:48	-0.35	-0.34	11.32	11.61	O2/CO2 Span (12.00/11.99%)
4/28/2015	16:50:48	-0.26	-0.33	10.89	11.33	

End Run 7 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	17:18:48	0.02	0.04	0.13	0.06	
4/28/2015	17:19:48	0.01	0.05	0.07	0.05	Zero
4/28/2015	17:20:48	0.13	-0.02	0.15	0.37	
4/28/2015	17:21:48	17.95	18.18	0.09	0.07	
4/28/2015	17:22:48	24.12	23.77	0.03	0.05	
4/28/2015	17:23:48	24.34	23.96	0.02	0.03	
4/28/2015	17:24:48	24.49	24.06	0.02	0.03	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	17:25:48	24.30	23.81	0.13	0.58	
4/28/2015	17:26:48	6.52	6.05	9.03	10.57	
4/28/2015	17:27:48	-0.18	0.14	11.11	11.55	
4/28/2015	17:28:48	-0.58	-0.20	11.24	11.60	
4/28/2015	17:29:48	-0.73	-0.29	11.29	11.62	
4/28/2015	17:30:48	-0.73	-0.35	11.32	11.62	O2/CO2 Span (12.00/11.99%)
4/28/2015	17:31:48	-0.12	-0.28	10.02	11.04	

End Run 8 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	17:59:48	-0.24	-0.03	0.04	0.04	
4/28/2015	18:00:48	-0.21	-0.07	0.03	0.05	Zero
4/28/2015	18:01:48	0.11	-0.18	0.25	0.70	
4/28/2015	18:02:48	18.14	18.31	0.09	0.06	

4/28/2015	18:03:48	23.84	23.61	0.02	0.04	
4/28/2015	18:04:48	24.16	23.78	0.01	0.03	
4/28/2015	18:05:48	24.24	23.91	0.01	0.03	
4/28/2015	18:06:48	24.17	24.02	0.01	0.03	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	18:07:48	22.90	22.16	1.26	2.49	
4/28/2015	18:08:48	1.75	1.86	10.70	11.48	
4/28/2015	18:09:48	-0.09	0.07	11.18	11.57	
4/28/2015	18:10:48	-0.55	-0.28	11.28	11.60	
4/28/2015	18:11:48	-0.57	-0.34	11.33	11.61	
4/28/2015	18:12:48	-0.56	-0.32	11.36	11.61	O2/CO2 Span (12.00/11.99%)
4/28/2015	18:13:48	0.70	-0.24	9.66	10.92	

End Run 9 Bias/Drift Check

Date	Time	NOx [ppm]	CO [ppm]	O2 [%]	CO2 [%]	
4/28/2015	18:40:48	-0.24	-0.17	0.11	0.05	
4/28/2015	18:41:48	-0.34	-0.17	0.07	0.05	Zero
4/28/2015	18:42:48	-0.25	-0.14	0.14	0.38	
4/28/2015	18:43:48	16.02	16.35	0.14	0.12	
4/28/2015	18:44:48	23.66	23.50	0.03	0.03	
4/28/2015	18:45:48	23.96	23.64	0.02	0.03	
4/28/2015	18:46:48	24.07	23.76	0.02	0.03	
4/28/2015	18:47:48	24.08	23.81	0.01	0.03	NOx/CO Span (24.85/24.68 ppm)
4/28/2015	18:48:48	14.23	14.70	6.56	6.14	
4/28/2015	18:49:48	-0.07	0.12	11.15	11.53	
4/28/2015	18:50:48	-0.76	-0.45	11.34	11.59	
4/28/2015	18:51:48	-0.79	-0.53	11.40	11.60	
4/28/2015	18:52:48	-0.76	-0.53	11.44	11.62	O2/CO2 Span (12.00/11.99%)
4/28/2015	18:53:48	-0.36	-0.51	12.61	8.98	

Analyzer Calibration Error Summary

Project No. 1501C
Date: 4/28/2015
Technician: Ed
Location: Vertical Stack

Client: Solvay Chemicals
Facility: Green River
Processes or Sources: BO-4

Analyzer Calibration Error (%)

Parameter	NOx	CO	O2	CO2	
Analyzer	CAI ZRE	CAI ZRE	CAI ZRE	CAI ZRE	API 100A
Units	ppm	ppm	%	%	
Span (range)	0 - 49.7 ppm	0 - 49.4 ppm	0 - 22.92 %	0 - 22.91 %	
Zero	0.10%	0.10%	0.79%	0.04%	
High Span	1.31%	0.34%	0.13%	0.04%	
Mid Span	0.02%	0.02%	0.22%	0.00%	

Error must be < 2%

Gas Divider Certification Summary

EPA Protocol 1 Gasses

Challenge Gas O2
Cylinder Number: CC99429
Undivided Conc.: 22.92 %

Verification Cas O2
Cylinder Number: EB0033423
Verification Conc.: 11.990%

Dilution Data

	Target 1	Target 2	Verification
Expected Concentration	15.00	9.00	11.990%
Challenge 1	14.97	9.04	12.01
	0.20%	**0.44%**	**0.17%**
Challenge 2	14.93	9.04	12.02
	0.47%	**0.44%**	**0.25%**
Challenge 3	14.99	9.03	12.01
	0.07%	**0.33%**	**0.17%**
Average	14.96	9.04	12.01
% Difference*	**0.24%**	**0.41%**	**0.19%**

* Must be <2%

Method 205 Gas Divider Verification

Date	Time	O2 [%]	
4/28/2015	9:21:48	14.95	
4/28/2015	9:22:48	14.97	High O2 Challenge (15.00 %)
4/28/2015	9:23:48	11.25	
4/28/2015	9:24:48	9.23	
4/28/2015	9:25:48	9.10	
4/28/2015	9:26:48	9.06	
4/28/2015	9:27:48	9.04	Mid O2 Challenge (9.00 %)
4/28/2015	9:28:48	9.82	
4/28/2015	9:29:48	11.99	
4/28/2015	9:30:48	12.00	
4/28/2015	9:31:48	12.01	Verification O2 Challenge (11.99 %)
4/28/2015	9:32:48	13.25	
4/28/2015	9:33:48	14.92	
4/28/2015	9:34:48	14.93	High O2 Challenge (15.00 %)
4/28/2015	9:35:48	11.23	
4/28/2015	9:36:48	9.12	
4/28/2015	9:37:48	9.08	
4/28/2015	9:38:48	9.06	
4/28/2015	9:39:48	9.04	Mid O2 Challenge (9.00 %)
4/28/2015	9:40:48	10.52	
4/28/2015	9:41:48	11.91	
4/28/2015	9:42:48	12.01	
4/28/2015	9:43:48	12.02	
4/28/2015	9:44:48	12.02	Verification O2 Challenge (11.99 %)
4/28/2015	9:45:48	13.34	
4/28/2015	9:46:48	14.98	
4/28/2015	9:47:48	14.99	High O2 Challenge (15.00 %)
4/28/2015	9:48:48	13.25	
4/28/2015	9:49:48	9.23	
4/28/2015	9:50:48	9.09	
4/28/2015	9:51:48	9.06	
4/28/2015	9:52:48	9.04	
4/28/2015	9:53:48	9.03	Mid O2 Challenge (9.00 %)
4/28/2015	9:54:48	10.15	
4/28/2015	9:55:48	11.98	
4/28/2015	9:56:48	12.01	
4/28/2015	9:57:48	12.01	Verification O2 Challenge (11.99 %)
4/28/2015	9:58:48	12.01	

Optimal
AIR TESTING SERVICES, INC

APPENDIX F

Equipment Calibrations and Calibration Gas Certifications

Type S Pitot Tube Inspection Data

Optimal
AIR TESTING SERVICES, INC

Date: 20-Aug-14 Pitot Number: V-9-1

Pitot Tube Assembly Level? yes X no

Pitot Tube Assembly Damaged? yes no X
If yes explain below.

α_1 2.1 *(<10 °)* α_2 0.3 *(<10 °)*

β_1 3.8 *(<5 °)* β_2 3.6 *(<5 °)*

γ = 1.7 ° θ = 5.2 °

A = 0.792 inches

Z = A SINE γ = 0.0235 inches *Where Z is < 0.32 cm (<1/8 in)*

W = A SINE θ = 0.0718 inches *Where W is < 0.08 cm (<1/32 in)*

Pa = 0.385 inches Pb = 0.402 inches

P = (Pa + Pb) / 2 = 0.394 inches

Dt = 0.372 inches P/ Dt = 1.058 inches *Where 1.05 ≤ P/Dt*

Comments: Meets geometric calibration requirements.

Cp = 0.84

108 inch effective probe

Additional Calibration Required? yes no X

Calibrated by: Luke Sorenson

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Calibration Gases & Equipment

EPA Protocol Standard Gas Mixture

Report of Analysis and Certification

Manufactured at/by:

EPA Protocol Vendor ID P12014

To:
Norco, Inc
Capser Warehouse
3333 W Yellowstone HW
Mills, WY 82644

NorLab Order #	34233957	Date Certified:	04/07/14	
Customer PO#	N/A	Cylinder Pressure:	2000	psig @ 70 F
Part Number	SPG 5E1660500PM1			
Lot Number:	4-086-522			
Cylinder Number	CC 188738	Expiration Date:	04/06/22	

Component(s)	Conc. V/V	± EPA Uncertainty	Analyzer1 (CO, SO2)	MTO 60a FTIR			
Sulfur Dioxide, ppm	504.7	3.3	Calibrated:	Assay 1; 2; 3	3/18/2014	3/18/2014	
Nitric Oxide, ppm	501.5	3.3	Analyzer 2 (NO,Nox)	MTO 60a FTIR			
Total Nox, ppm	501.7						
Carbon Monoxide, ppm	498.3	3.6	Calibrated:	Assay 1; 2; 3	3/18/2014	3/18/2014	
Nitrogen, O2 Free	Balance						

Reference Standard Data

Component	Lot# and XP Date (MM/YR)	ID	Cyl#	Sam#	Conc.	U
Sulfur Dioxide, ppm	2-087-170 XP 8x15	GMIS 1661a	CC 45427	na	252.5	1.3
Traceable Std if GMIS	9-126-600 XP 1x17	SRM 1661a	FF28137	94-H-18	490.9	3.9
Nitric Oxide, ppm	2-087-170 XP 8x15	GMIS 1685b	CC 45427	na	251	0.75
Traceable Std if GMIS	9-188-600 XP 11x15	SRM1685b	CAL 017391	43-L-25	244.5	1.1
Carbon Monoxide, ppm	2-087-170 XP 8x15	GMIS 2636a	CC 45427	na	250.3	1.3
Traceable Std if GMIS	0-130-602 XP 9x17	SRM 2636a	FF23070	57-E-08	247.1	1.2

4-086-522 casper 34233957

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Calibration Gases & Equipment

EPA Protocol Standard Gas Mixture

Report of Analysis and Certification

Manufactured at/by:

EPA Protocol Vendor ID P12014

To:
Norco
Casper Warehouse
3333 W Yellowstone Hwy
Mills, WY., 82644

NorLab Order #	34233957-00	Date Certified:	04/22/14
Customer PO#	Optimal Air Testing Svcs	Cylinder Pressure:	1990 psig @ 70 F
Part Number	SPG 5E101312VM1		
Lot Number:	4-093-523		
Cylinder Number	EB 0033423	Expiration Date:	04/21/22

Component(s)	Conc. V/V	± EPA Uncertainty	Analyzer1 (CO2)	MTO 97b Servomex NDIR			
Carbon Dioxide, %	11.95	0.118	Calibrated:	Assay 1; 2; 3	3/26/2014		
Oxygen, %	11.99	0.059	Analyzer 2 (O2)	MTO 97a Paramagnetic Analyzer			
			Calibrated:	Assay 1; 2; 3	3/24/2014		
Nitrogen, O2 Free	Balance		Analyzer 3	MTO60a Nicolet 6700 FTIR			
			Calibrated:	Assay 1; 2; 3			

Reference Standard Data

Component	Lot# and XP Date (MM/YR)	ID	Cyl#	Sam#	Conc.	U
Carbon Dioxide, %	9-132-162 1x16	GMIS2745	CC 45369	0	15.633	0.05
Traceable Std if GMIS	9-126-601 6x17	CAL016091	9-C-16	72-D-46	15.633	0.037
Oxygen, %	3-079-161 6x18	GMIS2658a	CC 53742		9.913	0.046
Traceable Std if GMIS	0-130-160 6x17	SRM 2758a	CAL016746	72-D-46	9.918	0.022

0	0	0	0		0	0
Traceable Std if GMIS	0	0	0	0	0	0

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EPA Protocol Standard Gas Mixture

Report of Analysis and Certification

Manufactured at/by:

EPA Protocol Vendor ID P12014

To:
Norco
Casper Warehouse
3333 W Yellowstone Hwy
Mills, WY., 82644

NorLab Order #	34571837	Date Certified:	05/21/14
Customer PO#	Optimal Air Testing Svcs	Cylinder Pressure:	1845 psig @ 70 F
Part Number	SPG 5E101323VM1		
Lot Number:	4-134-525		
Cylinder Number	CC99429	Expiration Date:	05/20/22

Component(s)	Conc. V/V	± EPA Uncertainty	Analyzer1 (CO2)	MTO 97b Servomex NDIR			
Carbon Dioxide, %	22.91	0.13	Calibrated:	Assay 1; 2; 3	5/16/2014		
Oxygen, %	22.92	0.11	Analyzer 2 (O2)	MTO 97a Paramagnetic Analyzer			
			Calibrated:	Assay 1; 2; 3	4/29/2014		
Nitrogen, O2 Free	Balance		Analyzer 3	MTO60a Nicolet 6700 FTIR			
			Calibrated:	Assay 1; 2; 3			

Reference Standard Data

Component	Lot# and XP Date (MM/YR)	ID	Cyl#	Sam#	Conc.	U
Carbon Dioxide, %	9-132-161 1x16	GMIS2745	CC45369	0	15.633	0.036
Traceable Std if GMIS	9-126-601 6x17	CAL016091	9-C-16	72-D-46	15.633	0.037
Oxygen, %	3-079-161 6x18	GMIS2658a	CC 53742		9.913	0.046
Traceable Std if GMIS	0-130-160 6x17	SRM 2758a	CAL016746	72-D-46	9.918	0.022

0	0	0	0		0	0
Traceable Std if GMIS	0	0	0	0	0	0

4-134-525 CC99429 Casper 34571837 O2,CO2 rev 4-22-14

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Calibration Gases & Equipment

EPA Protocol Standard Gas Mixture

Report of Analysis and Certification

Manufactured at/by:

EPA Protocol Vendor ID P12014

NLB Lot# 4-134-525

NLB Serial # CC99429

Replicate Analysis Data								
Assay 1			Assay 2			Assay 3		
CO2, %		O2, %					NO	
5/21/2014		5/21/2014						
22.91		22.93						
22.89		22.92						
22.93		22.92						
22.91		22.92						

The analysis listed in this report was performed in accordance with the Procedure G1 of the EPA Traceability Protocol, EPA 600/R-12/531 May 2012.

The contents of this cylinder must not be used if the pressure is less than 100 psig.

Analyst: _____ *Approved:* _____

Aaron Schwenken, Lab Technician **Charles Eckman, Quality Assurance Unit**

4-134-525 CC99429 Casper 34571837 O2,CO2 rev 4-22-14

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SOLVAY2016_1.2_002001

Calibrations for Meter Box 4

Full Test Meter Calibration - Critical Orifice Meter Box 4

Technician: **Eric Hagen**

Date of Calibration: 3/20/2015

Run No.	1A	1B	2A	2B	3A	3B	Average
Barometric Pressure, Pb	24.82	24.82	24.82	24.82	24.82	24.82	
Calibration Orifice Coef. (K)	0.7210	0.7210	0.4430	0.4430	0.3090	0.3090	
Final Meter Reading, ft^3	57.478	64.692	70.323	75.953	80.681	85.392	
Initial Meter Reading, ft^3	50.321	57.478	64.692	70.323	75.953	80.681	
Total Metered Volume, ft^3	7.157	7.214	5.631	5.630	4.728	4.711	
Initial Inlet Meter Temp, °F	49	55	61	60	61	62	
Final Inlet Meter Temp, °F	55	61	60	64	62	64	
Initial Outlet Meter Temp, °F	48	51	55	58	60	61	
Final Outlet Meter Temp, °F	51	55	57	59	61	62	
Average Meter Temp, °R	511	516	518	520	521	522	
Time: Minutes of Run Time	8	8	10	10	12	12	
Seconds of Run Time	0.00	0.00	0.00	0.00	0.00	1.00	
Initial Orifice pressure drop, ΔH	2.20	2.20	0.83	0.83	0.41	0.41	
Final Orifice pressure drop, ΔH	2.20	2.20	0.83	0.83	0.40	0.40	
Avg. Orifice pressure drop, ΔH	2.20	2.20	0.83	0.83	0.41	0.41	
Ambient (Orifice) Temp., °F	55	61	62	63	59	62	
Vacuum Setting, "Hg	13.5	13.5	17.0	17.0	19.0	19.0	
$V_{cr\ std}$	6.308	6.272	4.812	4.808	4.040	4.034	
Std, Volume Metered, Q_{std}, ft^3	6.175	6.167	4.769	4.750	3.978	3.954	
Calibration Factor (Y)	1.022	1.017	1.009	1.012	1.016	1.020	**1.0160**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	
Orifice Cal. Factor, ΔH @	1.729	1.733	1.712	1.709	1.694	1.700	**1.7127**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	

Calibrations for Meter Box 3

Full Test Meter Calibration - Critical Orifice Meter Box 3

Technician: **E. Hagen**

Date of Calibration: 1/8/2015

Run No.	1A	1B	2A	2B	3A	3B	Average
Barometric Pressure, Pb	24.83	24.83	24.83	24.83	24.83	24.83	
Calibration Orifice Coef. (K)	0.7210	0.7210	0.4430	0.4430	0.3090	0.3090	
Final Meter Reading, ft^3	634.963	641.526	647.283	653.040	657.809	662.597	
Initial Meter Reading, ft^3	628.413	634.963	641.526	647.283	653.040	657.809	
Total Metered Volume, ft^3	6.550	6.563	5.757	5.757	4.769	4.788	
Initial Inlet Meter Temp, °F	63	63	66	66	66	65	
Final Inlet Meter Temp, °F	63	65	65	65	65	64	
Initial Outlet Meter Temp, °F	62	63	65	66	65	64	
Final Outlet Meter Temp, °F	63	66	66	66	65	64	
Average Meter Temp, °R	523	524	526	526	525	524	
Time: Minutes of Run Time	7	7	10	10	12	12	
Seconds of Run Time	0.00	0.00	0.00	0.00	0.00	0.00	
Initial Orifice pressure drop, ΔH	2.30	2.20	0.91	0.91	0.44	0.44	
Final Orifice pressure drop, ΔH	2.20	2.30	0.91	0.91	0.44	0.44	
Avg. Orifice pressure drop, ΔH	2.25	2.25	0.91	0.91	0.44	0.44	
Ambient (Orifice) Temp., °F	63	63	63	63	62	62	
Vacuum Setting, "Hg	13.5	13.5	17.0	17.0	19.0	19.0	
$V_{cr\ std}$	5.480	5.480	4.810	4.810	4.030	4.030	
Std, Volume Metered, Q_{std}, ft^3	5.525	5.520	4.811	4.809	3.982	4.005	
Calibration Factor (Y)	0.992	0.993	1.000	1.000	1.012	1.006	**1.000**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	
Orifice Cal. Factor, ΔH @	1.754	1.749	1.855	1.854	1.836	1.839	**1.815**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	

Calibrations for Meter Box 2

Full Test Meter Calibration - Critical Orifice Meter Box 2

Technician: **E. Hagen**

Date of Calibration: 1/8/2015

Run No.	1A	1B	2A	2B	3A	3B	Average
Barometric Pressure, Pb	24.83	24.83	24.83	24.83	24.83	24.83	
Calibration Orifice Coef. (K)	0.7210	0.7210	0.4430	0.4430	0.3090	0.3090	
Final Meter Reading, ft^3	222.057	228.538	234.325	240.070	244.888	249.713	
Initial Meter Reading, ft^3	215.623	222.057	228.538	234.325	240.070	244.888	
Total Metered Volume, ft^3	6.434	6.481	5.787	5.745	4.818	4.825	
Initial Inlet Meter Temp, °F	60	63	66	65	66	66	
Final Inlet Meter Temp, °F	62	64	64	66	66	68	
Initial Outlet Meter Temp, °F	61	62	65	64	66	67	
Final Outlet Meter Temp, °F	62	65	65	66	66	67	
Average Meter Temp, °R	521	524	525	525	526	527	
Time: Minutes of Run Time	7	7	10	10	12	12	
Seconds of Run Time	0.00	0.00	0.00	0.00	0.00	0.00	
Initial Orifice pressure drop, ΔH	2.10	2.10	0.81	0.80	0.40	0.40	
Final Orifice pressure drop, ΔH	2.00	2.00	0.81	0.80	0.40	0.40	
Avg. Orifice pressure drop, ΔH	2.05	2.05	0.81	0.80	0.40	0.40	
Ambient (Orifice) Temp., °F	65	66	64	65	64	68	
Vacuum Setting, "Hg	13.5	13.5	17.0	17.0	19.0	19.0	
$V_{cr\ std}$	5.469	5.464	4.805	4.801	4.022	4.007	
Std, Volume Metered, Q_{std}, ft^3	5.439	5.455	4.840	4.802	4.017	4.015	
Calibration Factor (Y)	1.006	1.002	0.993	1.000	1.001	0.998	**1.000**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	
Orifice Cal. Factor, ΔH @	1.607	1.603	1.655	1.637	1.672	1.682	**1.643**
Tolerance within allowable limits	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	*Pass*	

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APPENDIX G

Sample Calculations

Sample Calculations – Run 1 of Boiler 1

Volume of Water Vapor Collected (wscf)

$$V_{wstd} = 0.04707\,x(W_{wc} + W_{sg})$$

$$V_{wstd} = 0.04707\,x(95.3)$$

$$V_{wstd} = 4.49 wscf$$

Where:

V_{wstd}	volume of water vapor collected at standard conditions (scf)
W_{wc}	weight of liquid collected in the impingers (g)
W_{sg}	weight of liquid collected in silica gel (g)
0.04707	conversion factor (ft^3/g)

Volume of Gas Sample, Corrected to Standard Conditions (dscf)

$$V_{mstd} = \frac{(17.64)(V_m)\left(P_b + \frac{\Delta H}{13.6}\right)(Y_d)}{(460 + T_m)}$$

$$V_{mstd} = \frac{(17.64)(33.662)\left(23.80 + \frac{0.85}{13.6}\right)(1.000)}{(460 + 82)}$$

$$V_{mstd} = 26.16\,dscf$$

Where:

V_{mstd}	volume of gas sample, corrected to standard conditions (scf)
V_m	volume of gas sample at meter conditions (ft^3)
P_b	barometric pressure (in. Hg)
ΔH	average pressure drop across meter orifice (in. H_2O)
Y_d	gas meter correction factor (dimensionless)
T_m	average dry gas meter temperature (^oF)
13.6	conversion factor (in. H_2O/in. Hg)
17.64	ratio of standard temperature over standard pressure (^oR/in. Hg)
460	conversion factor (^oF to ^oR)

Stack Gas Pressure (in. Hg)

$$P_a = P_b + \left(\frac{P_s}{13.6}\right)$$

$$P_a = 23.80 + \left(\frac{-0.12}{13.6}\right)$$

$$P_a = 23.79\, in.\, Hg$$

Where:

P_a	absolute sample gas pressure (in. Hg)
P_b	barometric pressure (in. Hg)
P_s	static pressure (in. H_2O)
13.6	conversion factor (in. H_2O/in. Hg)

Measured Moisture Content (%)

$$B_{wo} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

$$B_{wo} = \frac{4.49}{26.16 + 4.49}$$

$$B_{wo} = 0.1464$$

$$B_{wo} = x100 = 14.64\ \%$$

Where:

B_{wo}	water vapor of the gas stream (%)
V_{mstd}	volume of gas sample, corrected to standard conditions (scf)
V_{wstd}	volume of water vapor collected at standard conditions (scf)
100	conversion factor

Saturated Moisture Content (water vapor concentration), percent

$$B_{ws}^{*} = \frac{\left(10^{\left(8.361 - \frac{1893.5}{Temp_{stack} - 27.65}\right)}\right) - 0.5}{P_s} x\,100$$

$$= \frac{\left(10^{\left(8.361 - \frac{1893.5}{(((119 - 32)(5/9)) + 273.15) - 27.65}\right)}\right) - 0.5}{23.79\left(\frac{25.4\ mm}{1\ inch}\right)} x\,100 = 13.39\ \%$$

Molecular Weight of Dry Gas Stream (lb/lb-mole)

$$M_d = MW_{CO_2}\frac{(\%CO_2)}{(100)} + MW_{O_2}\frac{(\%O_2)}{(100)} + MW_{CO+N_2}\frac{(\%CO + \%N_2)}{(100)}$$

$$M_d = 44.0\frac{(12.40)}{(100)} + 32.0\frac{(6.93)}{(100)} + 28.0\frac{(100 - 12.40 - 6.93)}{(100)}$$

$$M_d = 30.26\,lb/lb-mole$$

Where:

M_d	molecular weight of the dry gas stream (lb/lb-mole)
MW_{CO2}	molecular weight of carbon dioxide (lb/lb-mole)
MW_{O2}	molecular weight of oxygen (lb/lb-mole)
MW_{CO+N2}	molecular weight of carbon monoxide and nitrogen (lb/lb-mole)
$\%CO_2$	carbon dioxide concentration in the dry gas stream (%)
$\%O_2$	oxygen concentration in the dry gas stream (%)
$\%CO + \%N_2$	carbon monoxide and nitrogen in the dry gas stream (%)
100	conversion factor

Molecular Weight of Wet Gas Stream (lb/lb-mole)

$$M_s = (M_d)(1 - B_{wo}) + (MW\ H_2O)(B_{wo})$$

$$M_s = (30.26)(1 - 0.1358) + (18.0)(0.1358)$$

$$M_s = 28.62\,lb/lb-mole$$

Where:

M_s	molecular weight of the wet gas stream (lb/lb-mole)
M_d	molecular weight of the dry gas stream (lb/lb-mole)
MW_{H2O}	molecular weight of water (lb/lb-mole)
B_{wo}	water vapor of the gas stream (%)

Velocity of Gas Stream (ft/sec)

$$V_s = (85.49)(C_p)\left(\sqrt{\Delta P}\right)\left(\sqrt{\frac{(T_s+460)}{(M_s)(Ps)}}\right)$$

$$V_s = (85.49)(0.84)(0.5808)\left(\sqrt{\frac{(119+460)}{(28.62)(23.79)}}\right)$$

$$V_s = 38.46\,ft/\sec = 2{,}307\,ft/\min ute$$

Where:

V_s	gas stream velocity (ft/sec)
85.49	pitot tube constant (ft/sec)([lb/lb-mole)(in. Hg)]/[(^oR)(in. H_2O)])$^{1/2}$
C_p	pitot tube coefficient (dimensionless)
$\sqrt{\Delta P}$	average square roots of velocity pressures (in. H_2O)$^{1/2}$
T_s	average gas stream temperature (^oF)
M_s	molecular weight of the wet gas stream (lb/lb-mole)
P_s	absolute sample gas pressure (in. Hg)
460	conversion (^oF to ^oR)

Volumetric Flow Rate of Gas Stream (acfm)

$$Q_a = (A_s)(V_s)$$

$$Q_a = (41.16)(2307)$$

$$Q_a = 94{,}965\,acfm$$

Where:

Q_a	volumetric flow rate of gas stream at actual conditions (acfm)
V_s	gas stream velocity (ft/sec)
A_s	cross sectional area of sample location (ft^2)
60	conversion factor (sec/min)

Volumetric Flow Rate of Gas Stream (scfm)

$$Q_{std} = \frac{17.64(Q_a)(P_s)}{(T_s+460)}$$

$$Q_{std} = \frac{17.64(94965)(23.79)}{(119+460)}$$

$$Q_{std} = 68{,}868\,scfm = 68.868\,kscfm$$

Where:

Q_{std}	volumetric flow rate of gas stream at standard conditions (scfm)
Q_a	volumetric flow rate of gas stream at actual conditions (acfm)
P_a	absolute sample gas pressure (in. Hg)
T_s	average gas stream temperature (^oF)
460	conversion (^oF to ^oR)
17.64	ratio of standard temperature over standard pressure (^oR/in. Hg)

Dry Volumetric Flow Rate of Gas Stream (dscfm)

$$Q_{dstd} = (Q_{std})(1 - B_{wo})$$

$$Q_{dstd} = (68{,}868)(1 - 0.1358)$$

$$Q_{dstd} = 59{,}515\, dscfm$$

Where:

Q_{dstd}	volumetric flow rate of gas stream at standard conditions, dry basis (dscfm)
Q_{std}	volumetric flow rate of gas stream at standard conditions (scfm)
B_{wo}	water vapor of the gas stream (%)

Nitrogen Oxides Concentration (drift corrected, ppmdv)1

$$C_d = \left(C - \left(\frac{C_{oi} + C_{of}}{2}\right)\right)\left(\frac{C_{ma}}{\left(\frac{C_{mi} + C_{mf}}{2}\right) - \left(\frac{C_{oi} + C_{of}}{2}\right)}\right)$$

$$C_d = \left(293.84 - \left(\frac{0.21 + 1.71}{2}\right)\right)\left(\frac{248.51}{\left(\frac{248.52 + 249.51}{2}\right) - \left(\frac{0.21 + 1.71}{2}\right)}\right)$$

$$C_d = 293.41\, ppmdv$$

Where:

C_d	nitrogen oxides concentration, corrected for analyzer drift (ppmdv)
C	measured nitrogen oxides concentration (ppmdv)
C_{oi}	initial system calibration bias check response for the zero gas (ppm)
C_{of}	final system calibration bias check response for the zero gas (ppm)
C_{mi}	initial system calibration bias check response for the upscale gas (ppm)
C_{mf}	final system calibration bias check response for the upscale gas (ppm)
C_{ma}	actual concentration of the upscale calibration gas (ppm)

1 Calculations for oxygen, carbon dioxide and sulfur dioxide are performed in the same manner.

NOx emission rate, lb/hr

$$E_{NOx} = \frac{C_{NOx}(M_{NOx})(Q_{std})(60)}{(385.3)(10^6)} = \frac{(293.41)(46.01)(59{,}651)(60)}{(385.3)(10^6)} = 125.40\frac{lb}{hr}$$

Note CO emissions were calculated similarly using a molecular weight of 28.01

Where:

C_{NOx}	corrected concentration of NOx
M_{NOx}	molecular weight of NOx
Q_{std}	volumetric flow rate of gas stream at standard conditions, dry basis (dscfm)

Nitrogen Oxides Emission Rate (lb/mmBtu)2

$$E_{lb/mmBtu} = \frac{(C_d)(MW_{NOx})(Fc)(100)}{(385.3)(10^6)(CO_2)}$$

$$E_{lb/mmBtu} = \frac{(293.41)(46.01)(1800)(100)}{(385.3)(10^6)(12.40)}$$

$$E_{lb/mmBtu} = 0.509\, lb/mmBtu$$

Where:

$E_{lb/mmBtu}$	nitrogen oxides emission rate (lb/mmBtu)
C_d	nitrogen oxides concentration, corrected for analyzer drift (ppmdv)
MW_{NOx}	molecular weight of nitrogen oxides (lb/lb-mole)
F_c	Fuel factor for bituminous coal, (scf/mmBtu)
385.3	volume occupied by one pound of gas at standard conditions (dscf/lb-mole)
10^6	conversion factor (fraction to ppm)

2 Calculations for sulfur dioxide are performed in the same manner using the appropriate molecular weight.

RATA Calculations – NOx ppm, Runs 1 through 9

Standard Deviation

$$S_{dev} = \sqrt{\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{(n-1)}}$$

$$S_{dev} = \sqrt{\frac{197.12 - \frac{1249.62}{9}}{(9-1)}}$$

$$S_{dev} = 2.70$$

Where:

S_{dev}	standard deviation
Σ	summation
n	number of data sets used for calculations
d_i	difference between the reference method result and the CEM value for a given run (ppm)
i	run number

Confidence Coefficient

$$CC = (t_{0.975})\frac{(S_{dev})}{(\sqrt{n})}$$

$$CC = (2.306)\frac{(2.70)}{(3.0)}$$

$$CC = 2.02$$

Where:

CC	confidence coefficient
S_{dev}	standard deviation
n	number of data sets used for calculations
$t_{0.975}$	the inverse of the Student's t-distribution for the specified degrees of freedom

Relative Accuracy

$$RA = \left(\frac{\left|\overline{d}_{avg}\right| + \left|CC\right|}{RM_{avg} \text{ or } E_{standard}} \right) x100$$

$$RA = \left(\frac{\left|-3.93\right| + \left|2.02\right|}{293.39} \right) x100$$

$$RA = 2.03\%$$

Where:

RA	relative accuracy
CC	confidence coefficient
d_{avg}	mean of the differences
RM_{avg}	reference method average
$E_{standard}$	applicable emission standard
100	conversion factor (%)

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APPENDIX H

Solvay Process Data

BO-1 AQD #18
RATA
4/29-30/2015
STEAM FLOW

RUN TIMES	lbs/hr	% LOAD
#1 13:12 - 13:33 4/29	198359	66%
#2 14:14 - 14:35 4/29	197907	66%
#3 15:15 - 15:36 4/29	197944	66%
#4 16:20 - 16:41 4/29	207873	69%
#5 07:43 - 08:04 4/30	220824	74%
#6 09:11- 09:32 4/30	214643	72%
#7 10:23 - 10:44 4/30	219136	73%
#8 11:30 - 11:51 4/30	216423	72%
#9 12:34 - 12:55 4/30	210537	70%

AVERAGE % LOAD FOR RUNS 1 - 9 **69.8%**

Permitted Steam Load: 300,000 lbs/hr

BO-2 AQD #19
RATA
5/4/2015
STEAM FLOW

RUN TIMES	lbs/hr	% LOAD
#1 08:43 - 09:04	198347	66%
#2 09:27 - 09:48	196916	66%
#3 10:19 - 10:40	200754	67%
#4 11:12 - 11:33	209361	70%
#5 12:08 - 12:29	216762	72%
#6 12:58 - 13:19	217122	72%
#7 13:44 - 14:05	218714	73%
#8 14:30 - 14:51	215825	72%
#9 15:18 - 15:39	215598	72%

AVERAGE % LOAD FOR RUNS 1 - 9 **70.0%**

Permitted Steam Load: 300,000 lbs/hr

BO-4 AQD #109
RATA
4/28/2015
STEAM FLOW

RUN TIMES	lbs/hr	% LOAD
#1 12:04 - 12:25	173502	87%
#2 12:52 - 13:13	172984	86%
#3 13:44 - 14:05	173646	87%
#4 14:26 - 14:47	173745	87%
#5 15:18 - 15:39	173475	87%
#6 16:03 - 16:24	173587	87%
#7 16:52 - 17:13	174115	87%
#8 17:32 - 17:53	173664	87%
#9 18:14 - 18:35	173465	87%

AVERAGE % LOAD FOR RUNS 1 - 9 **86.8%**

Permitted Steam Load: 200,000 lbs/hr